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THE STUDY OF EXPERIMENTAL PEDAGOGY IN GERMANY THIRD ARTICLE

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Modern investigations concerning psychic energy and fatigue led us in our last article to condemn the excessive concentration of instruction into the morning hours; instead, the afternoon hours 4:00 to 6:00 or 5:00 to 7:00 were to be secured for instruction.

But it appeared that this rearrangement did not in itself guarantee the welfare of the scholar. The problem of home work presented itself. What hours would remain to the scholar in which to do his work if such a long period of recreation separates the instruction of the morning from that of the afternoon, and the latter is brought so close to the evening? Here a dilemma presents itself, but at the same time we may discover the true point of view from which to solve it. That the scholar have enough recreation is a hygienic necessity. Is it also, we ask, a didactic necessity that he prepare work at home? One circumstance seems to point in that direction. In all subjects there is a great deal of material which the scholar can make his own only by mechanical memorizing. He must learn vocabularies in the languages, dates in historical subjects. He must in the same way master many statistical, geographical, biological, mineralogical, chemical, and physical facts in the geographical and natural sciences. No merely general survey of these facts,

no naming and mentioning on the part of the teacher (however often it is done), no cursory reading and re-reading of an incidental nature, can take the place of the mechanical impress.¹ The latter is necessary in order to lead the scholar to present knowledge in those lines in which he has previously exercised his understanding. It is not practicable to introduce this mechanical work into the lesson hour. That would fritter it irreparably away. Enough if the teacher in all subjects of instruction opens up and strengthens the understanding of the scholar, awakes his interest, and arouses his self-activity. The hour of instruction, at least in the middle and higher classes, ought not to be burdened with the mastering of the material that must be committed to memory. Home work appears then to be the only way left.

Should not the home work show besides how far the scholar, acting independently, can reproduce and utilize the material which has been previously gone over in the class? And so he is overwhelmed with compositions, translations, problems in geometrical construction, algebraic examples, drawings of geographical maps, and like exercises. These exercises are to spur him on to show his own industry, and to give him an opportunity to add to his knowledge and understanding the power to do.

Under the shelter of such considerations, teachers until a short time ago, dragged together from all sides material for memorizing and for practice, to load it upon the pupil for his out-of-school hours, and many still keep up the process. The scholars themselves are, of course, not even consulted; others think and act for them. If the making of the school regulations were in their hands, the result would be quite different. If it were the question of an expenditure of time and strength on the part of the aforesaid overzealous pedagogues themselves, if, after six hours of instruction in school they were expected to endure the constraint of several hours of work at home, they

¹ We shall come back to this important point in a later paper. See concerning it Meumann, *Zur Oekonomie und Technik des Lernens*, p. 29; Ebert and Meumann, *Ueber einige Grundfragen der Psychologie der Uebungsökonomie*, p. 206.

would indignantly protest—especially if the work compelled the body to be still when it was craving for movement, but on the other hand forced the mind, all tired and out of breath from its pace, to mount again and again the scientific steed, instead of straying at will in favorite haunts of fancy and sentiment. The adult refuses to play the rôle of an ever-willing machine. It is assumed off-hand to suit the weaker powers of the scholar.

To be sure many a scholar may turn with pleasure to the home task which has been assigned him. But consider that in the case of the average man even strong interests can stand only a certain degree of daily burdening. If these interests are over-stimulated, the danger grows that they will be dulled, yes, killed, even as in the case of overstrained bodily powers. On the other hand every athlete knows that a hard set of exercises, after some days of rest, succeeds with a surprisingly greater exactness. The same thing is true in the mental realm. Meumann's fine experimental investigation of the psychology of the phenomena of practice makes it clear that complete success in developing psycho-physical activity through practice is not gained if the exercise is repeated too frequently.² At all events an interest which has not become surfeited at home will be much more active and lively in the school. For this reason Berthold Otto,³ for months at a time, absolutely forbade his scholars, in the subjects which he teaches, to take work home. Long ago the able pedagogue Ratke (1571–1634) made the same demand, namely, that all the work "should fall upon the schoolmaster."

But now let us take the far more frequent case, that of the scholar who has no strength remaining with which to master the subjects from which the home work is taken, or at least no more strength remaining after the burden of the school hours. As no direct interest binds him to those tasks, they become for him an unpleasant exertion of will power. This is the harder for him, the more he feels the sacrifice of having to deny himself in his free hours to more agreeable employment.

Work under such circumstances is especially hard and especially unproductive. We know what a hindrance the feel-

² *A. A. O.*, pp. 195–216, 17.

³ Berthold Otto, *Concerning the Royal Office of the Parents*.

ing of the unpleasant or disagreeable is to all activities.⁴ Such work wearies in the highest possible degree, since the scholar, after the intense effort of instruction, plainly has need of recreation.

Add to this that the procedure of burdening the scholar with home work affects gifted and weak pupils very differently. While the former can perhaps accomplish the task assigned without suffering the injury of overwork, the latter must use two- and threefold the pains and efforts of the former to accomplish the same task. Thus a greater danger to their health threatens them along with the disadvantage under which they work, on account of their deficiency.

These weighty reasons lead us to regard compulsory home work as a much less wholesome means of education than it was formerly held to be. Among German teachers the following opinion is more and more gaining ground: That that teacher is the best whose discipline requires the least punishment and whose manner of teaching requires the least home exertion on the part of the scholars.⁵ In fact a skilful pedagogue can so direct the instruction that he will develop at the same time with the scholars' ability to grasp and understand their capacity for application, and will keep it in continual practice.

The necessity under which the scholars stand of impressing upon their minds a great deal of material that must be memorized by especial effort, has not yet been avoided. The learning of the lesson must still burden their leisure hours; questioning or examination upon this material must burden the hour of instruction. There seems little hope, indeed, of adjusting the two opposing interests, namely, the didactic demand for putting that kind of study work over into the scholar's free time, and the hygienic veto of such a transfer.

Nevertheless, the way of adjustment lies near at hand. It presents itself directly if we turn our attention to the intervals

⁴ Ebert and Meumann, *A. A. P.*, p. 202-7; *Sag. A. A. O.*, p. 124.

⁵ In the higher schools of Germany the experiment is now being tried of excusing from home work in other subjects those of the highest class who desire to work on independently in some one subject. This too is an admission that respect for compulsory home work has declined.

between school hours. These pauses—five minutes four times, and fifteen minutes once a day—are much too short. A pause of five minutes is not enough to bring about the relative recovery and refreshment which the pupil needs in order to pass from one subject of study to the next. The academic interval of fifteen minutes between all lectures, which has proved itself so excellent in the universities, is much more suitable. On this point, the didactic interests which lays stress upon the scholar's freshened capacity to receive, and the hygienic interest, which commands us not to let the effect of fatigue increase too much through lengthening the time, unite. The school of the future will have only four periods of instruction in the morning, and between every two of these, an interval of fifteen minutes.⁶ The three-quarters of an hour which is lost to us through such a shortening of the length of recitations, we add again to the afternoon hours. We insert it as a special instruction period, which will come in the time when the energy is strong, between 4:00 and 6:00, or 5:00 and 7:00, and takes its place besides the other lesson which we had thought to transfer thither. This supplementary hour must of course belong to the subjects from which time has been taken.

Two observations prepare the way for this plan. First, there is an *art* of studying which can be taught; and the teaching of it arouses an interest in mechanical learning itself, which once awakened lessens progressively the work of learning and makes studying more and more of a success. The particulars concerning it belong in a later article.

The other fact has been brought out by the experimental investigations of the work of the *class*. The attention of the class possesses a greater restraining power against interruptions; it is better able to shut the consciousness against the penetration of foreign attraction than can happen in the case of the work of the "isolated" scholar. Is it true that attention itself in a place where the assembling of many people involves unavoidable noise, is of itself armed with more intense restraint against threatening interruption? Is it true that the sight of the

⁶The experiment of having intervals of this length is now being tried in some of the schools of the Kingdom of Saxony.

attention paid by all the others acts suggestively on each individual? We know, indeed, how speaking in chorus rouses a sleepy class; even epileptic children, who at home oppose the words of their parents, in an institution learn to obey without contradiction the stroke of the bell, to write exercises, to commit to memory, to eat and to submit like normal children.⁷ In short, working in class is worth more and advances more rapidly than work at home. It is the old experience of the social nature of man, the fact known of old which is always confirmed anew in the workshop of every shoemaker and tailor, in every mine, or in any other industrial work, in every government department in every mercantile house: that on the average the work which men do in common is best done.

The school should not neglect such experiences. Better a common-school hour longer in the afternoon, making use of a favorable period of psychical energy (5:00 to 6:00 in the afternoon) devoted exclusively to mechanical learning or in the case of the older scholars to elocution and composition as well, than that constraint of home work which sins in an incalculable and uncontrollable way against the children's need of recreation! The "free" afternoon is a lie if the school takes again from its pupils ten times over the benefit of the freedom which it gives to them with seeming kindness. I am thinking of *special study hours*. Teachers of language, of history, of geography, and of science justly feel that it would be too great a drag on their advancing instruction if this instruction had also to impress with necessary firmness upon the pupils the mechanical material which they need. But it would be more than a mere expedient to bring together all the material to be memorized in each subject in one special hour of the afternoon. The directing teacher in systematic agreement with his colleagues, would have to have the material studied, partly with, partly after, and partly in advance of, the class. Above all he would have to transform the lesson, the study hour, into an art of study, that is, to awake, nourish, and raise into fruitful activity the interest of the scholar in mechanical learning itself, in the manner suggested above.

⁷ See Baesh, *Pädagogik*.

It is the egg of Columbus. It is self-evident, indeed, that this special study period does not need to be a new hour, which would only lengthen the time of instruction. We appropriate for it just that three-quarters of an hour which we had to cut off from the morning instruction in order to gain longer intervals between classes, and which, as unoccupied, we had transferred to the afternoon. If, as we propose here, the study hour takes charge of imprinting on the mind the mechanical material, the teaching hours proper will be relieved from the business of memorizing and repetition, and so it will first be possible to shorten them without deducting anything from the scientific work.

In brief, this arrangement would meet at once all points of view: the technical, that the scholar master his material to be memorized with special care; the hygienic, that to accomplish this the time in which the school busies its pupils must not be at all lengthened by home work; the other hygienic point of view, that of gaining longer intervals between classes; and the scientific, that the intensiveness of the study must not be allowed to suffer. The time which we take away from the hour of teaching in order to shorten it for the sake of the interval, is given back to each subject in the study hour, and indeed is given in a more rational form. Thus from a mathematical standpoint, the whole matter amounts to balancing the parts somewhat differently; the teaching is separated from the studying and the entire time of instruction distributed better on the energy curve of the day.

It is not enough that we release the scholar from homework and afford him fifteen minutes grace by the lengthened interval between classes. We must see to it also that he uses the interval for refreshment and recovery. The question forces itself upon us how these intervals are to be employed. On no account so that by the mode of filling up the time the very purpose for which they are designed, of giving recreation to the scholars, again be made illusory. That will happen if the children romp, jump, and wrestle. The experiments of Mosso have proved that bodily strain which is superimposed on a condition of mental weariness, gives no recreation, but increases the weariness.

Moreover, the passion with which boys and girls give themselves up to noisy play works in a manner that is detrimental to a mental condition of preparation for the instruction to follow.

Of course after the children have sat still in the lesson hour they feel the need of moving, and feel it strongly. But the form which strains and distracts must be avoided. What the body needs is the increased inhalation of oxygen, so that the toxine which the preceding weariness has created will be disintegrated. This stimulation of the circulation of the blood comes through light and temperate movement. Meumann found in experimenting on himself, that short walks of about half an hour could restore the initial capacity for work, even after a considerable fatigue. On this account a quarter of an hour interval between the hours of instruction promises to become an excellent arrangement, as soon as the scholars, instead of romping about, have the benefit of the fresh air only through quiet, restful movement. Even now it is so managed, at least in the fifteen-minute interval, that the scholars, in natural groups, walk in the court of the school under the care of a teacher. Would that our schools might maintain such walks between all successive school periods!

This is the basis for another question which is now much discussed, and which points out to us new pedagogical paths. If after the hour of instruction a stay in the open air can regenerate the blood, and free it from the material fatigue, then, if the instruction takes place near or in the fresh air, the fatigue will not from the very start rise to such a high degree. That is, teaching should be done as often as practicable with open windows, yes, in the open air. A. Schütz in particular, following Stoy's example, has recently made this pedagogical demand. Many a sensible schoolman is striving at the present time to realize it as far as possible. A relative of mine, Dr. Sebald Schwarz, Director of an industrial school in Lübeck, in the summer of 1906, had his boys out of doors for ninety class hours, and this did not take into account frequent afternoon walks.⁸ The plan of making the walks of the scholars a part of the

⁸ Cf. Dr. Sebald Schwarz, *Unsere Schülerreisen*; published by J. Harder, Altona.

instruction as the inquiries of Dr. Schwarz among 140 schools has proved, is still found much too rarely.

The demand for instruction out in the open goes back to Rousseau. It is supported at first not by hygienic but by didactic reasons. In fact it is consistently developed from the principle of observation. But how little does observation amount to if it is only from a book, a chart or a wall map, from stuffed skins of animals, or from wilted or dried mummies of plants, that the scholar learns the life of man, of animal, and plant which pulsates out of doors! How different is the effect when the teacher is allowed to take his scholars out of doors and say, What you learn in geography looks like this, the history of our people lives on in this way or that in what surrounds you daily; so germinate, bloom, and die the plants in wood and field and meadow; this is the way the worm and beetle, the bees and the butterflies move; this is how the birds fly, and this is how the footprints of wild beasts look. Or teacher and pupils look together upon the majesty of the starry heavens, and the teacher paints before the mind's eye of the pupils the genesis and origin of all the twinkling tiny points, which in reality are suns mighty and distant.

By such instruction, which naturally is not possible in all subjects, the attention is fixed; the imagination and fancy are animated. But, further, under these conditions the influence of the teacher gains more intimate and permanent access to the heart—the disposition and emotional nature—of the scholar, and this is the other didactic reason for taking walks with pupils. Let him believe it who will, that the heart and disposition can be formed *ad hoc* by narrow subjects of instruction. They can be developed only by cultivating the two roots of sentiment and disposition. These roots are nature and man's social life. But the former is excluded from the schoolroom, and society between teacher and taught is limited to a mere interchange through instruction. There is no real common life such as is found in the family. But it is only a community of life which can bring about intimate and all-sided contact of the ripe with the nascent man; it is only such contact that sets free by suggestion the

powers of the man in the making until he, too, becomes fully developed on all sides.

We have then the two influences—contact with nature, and more intimate contact with the personality of the teacher—uniting in their effect upon the heart of the scholar if instruction ventures more than heretofore into the open air, and if such society as is possible in instruction enlarges to become a society growing out of common walks and tours.

Moreover, such walking tours, thought of as parts of instruction, train the will of the scholar to more active virtues than that of passive sitting still. We have indicated already how effectively they make new horizons for the mind at the same time with the new horizon of the eye. In sum, the transferring as often as practicable of the instruction into the open air offers the suitable form to bring the old didactic demand of Rousseau—active contemplation of nature in pedagogical community of life between teacher and scholar—to greater honor in the sphere of the school. At the same time that thought of modern hygiene is satisfied which sees in the nervous strength of the scholar national capital, that must be developed as much as possible, and yet conserved with prudence as far as our progressive insight into fatigue, fatigue effects, and fatigue lessening in any way suggests. Once again the demands of far-seeing educational theory and of prudent hygiene stand side by side.

Does not all this mean that too much attention is paid to the scholars? It does no harm, it has often been urged, for boys to get thoroughly tired. Fatigue is the natural result of hard work. A child must learn to exert and apply himself mentally or else his will will not be disciplined. The experimental pedagogue, however, condemns the giving of lessons to children to take home with them. He wishes to transfer the instruction, as far as the weather and the subjects to be taught will allow, into the open air, to the walking tours, into the garden. The first proposal means loafing half the time; the second, loafing all the time. Where in this scheme are earnestness and industry? Where is the consciousness that not one's own enjoyment and caprice, but rather work and activity, determine the worth of

life? To awaken self-mastery and the feeling of responsibility in the scholar is just the business of education. The method presented above would kill both.

Objections such as these only show that human nature is judged all too pessimistically. It is clear that the six hours of which the school daily robs the children for its own purposes give ample opportunity to develop in them the virtues of industry and diligence. What a work of patience every scholar performs who, separated from the joys of the playground, interests himself and lets himself be interested in things which at first lie far outside the course of his spontaneous impulse to action. What discipline in attention already lies in this that, in the teaching hour the pupils must follow continuously the train of thought of the teacher, but must restrain their own associations, the impulses of their own wills! And finally the study hour, or to the maturer scholars, the practice hour, offers opportunity enough for the development of their industry. If we distrust the result obtained during the six school hours, it is hard to see just why more work at home by fatigued scholars should accomplish that miracle of training the will, which a mental discipline of six hours did not achieve.

On the other hand, how optimistically and lightly those dogmatic advocates of will-gymnastics overlook the injury with which every increase in the effects of uncompensated fatigue menaces the health of the school child! It is a good thing that we have learned to demonstrate these effects experimentally, and that we possess statistical data concerning the army of school diseases, the result of unadjusted and uncompensated waste of energy. Measure and number make a greater impression than the bare recording of facts, they sharpen the conscience. As it is a matter of course for us at the present time to provide good chairs in the classroom, which protect the scholars' spines, and good desks which protect their eyes, it is equally self-evident that we should not overstrain their nervous strength, that we should not misuse the school, the means of mental formation and education of our youth, to mistrain and deform their bodily life.

The child, as we have already mentioned, has no part in the

school legislation. He endures it even where it is faulty, and cannot defend himself except by becoming sick. He is given over into the power of adults who usurp the right to educate. Would that the adults might bear in mind the limits of that right with which they undertake the education of the children, so that it may not become a right of force! And would that they might reflect on the foundation of that right, would that they might raise Kant's critical question, "Quid juris?" in connection with education! Does it not seem like oppressing children simply to send them to school and rob them many hours a day of their freedom? That the more capable are compelled to sit together with the less gifted and by this means are kept back in their development until the less capable have also hobbed after? To give a wise answer to such questions might well dampen the zeal of those educational tyrants who see in our youth the passive material for pedagogical theories rather than for humane consideration.

EMPHASIS IN LATIN PROSE

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The variety of theories put forward to explain order and emphasis in the Latin sentence certainly warrants further attention to the subject. Almost all the possible views, it would seem, are to be found in our American grammars.

1. There is a normal, unemphatic, grammatical order. Emphasis is secured by departures from this. Any word except the subject is emphatic at the beginning, any except the verb at the end. (A. and G. grammar [edition of 1877], 343, 344; H. [complete], 665, 1, 2; Lane & Morgan, 1139, 1147; Kühner, Vol. II, p. 1072, etc.) This appears to be the traditional view.

2. The beginning and the end are both emphatic in all sentences. (Gildersleeve-Lodge, 672, 673.) In long sentences the means as well as the extremes are points of emphasis. But further (687): "We find the ascending structure, where the emphasis is continually ascending until it culminates at the end, more common."

3. Substantially the opposite of the view just quoted was presented first, apparently, in the 1877 edition of the Allen and Greenough grammar, and has been widely accepted. "In connected discourse, the word most prominent in the speaker's mind comes first; and so on in order of prominence" (new A. & G., 597). "The more important word is never placed last for emphasis" (597, b). So more explicitly still in the new Andrews and Stoddard (585): "the first word is more emphatic than the second, the second than the third, and so on."

It is the chief purpose of this paper to show that the Greenough theory is erroneous.

Let us consider first certain objections based upon general principles.

The theory that the first word is most emphatic, the second next in emphasis, and so on, involves the astonishing assumption

that emphasis was the sole consideration in determining Latin word-order. Mark the statement: "In any combination the first word is most emphatic," etc. Very well, then, the word that deserves most emphasis must be singled out and placed first, the word next in emphasis second, and so on, without regard to rhythm, connection, or perspicuity.

But we are perfectly certain that emphasis was not the sole consideration. We know, for Cicero and Quintilian both tell us so, that great attention was paid to a sort of prose rhythm (*Brutus*, 33). This is a quality difficult to analyze or define, but everywhere it is one of the elements that distinguish literary prose from common speech.¹ In his *Orator* (222) Cicero quotes from Crassus: "Missos faciant patronos: ipsi prodeant;" and comments thus: "nisi intervallo dixisset 'ipsi prodeant,' sensisset profecto se fudisse senarium (*omnino*) melius caderet 'prodeant ipsi.'" Without any hint that the emphasis might be misplaced, he would change the order for the sake of avoiding a poetic rhythm.

With equal positiveness we may set aside the notion of an all-the-way-down-hill or an all-the-way-up-hill emphasis. The emphatic words in a sentence are related to the other words very much as the accented syllable of a word is to the other syllables. Accent whether it consists of pitch, or stress, or both, as in English, is purely relative. We accent a syllable, not by giving it a predetermined and uniform amount of power, but by making it clearly different in utterance from the syllables before and after it; when two syllables of the same word are accented, there must be at least one unaccented syllable between. The attempt to accent the first syllable of a long word most strongly, the next slightly less, and so on to the end, would result, if successful, in no proper accent at all, but only in a downward slide, a ludicrous bit of vocal gymnastics.

In a similar way, emphasis is purely relative stress. An unemphatic word in the more earnest portion of an address may be uttered with much more power than the most emphatic word

¹ Cf. *Orator*, 195: "quia nec numerosa esse ut poema, neque extra numerum, ut sermo volgi, esse debet oratio."

in a quiet passage. But everywhere, if a particular word or phrase is to stand out prominently, the adjacent words must, so to speak, retire to the background. If two words in the same clause, expressing distinct ideas, are to be emphasized strongly, one or more unstressed words must be interposed, just as surely as two mountains necessitate a valley between. In applying this principle, it must be remembered that emphasis is for the sake of the idea, not of the word merely; and therefore, if two or more words combine to express one concept ("O you *hard hearts!* you *cruel men of Rome*"), emphasis will fall upon the group, not upon any one word to the exclusion of the others. Two independent and even contrasted concepts may indeed be juxtaposed; the "valley between" will then be narrowed to a rhetorical pause; but without any separation between the two stressed words all effectiveness would be lost.

The obvious and certain principles so far stated afford no aid in deciding between the opposite theories of diminuendo and crescendo emphasis. Another general consideration may be of service here, derived from the laws of argumentation.

The Romans were a nation of public speakers. The first prose writings deemed worthy of preservation were orations. When Fabius Pictor and Cincius Alimentus were writing Roman history in Greek, Cato's speeches were already treasured, and Cicero himself thought it worth his while to seek out and read more than one hundred and fifty of them. It seems reasonable to infer that the long-continued effort to secure effectiveness in oratory must have been the paramount influence in determining the chief features of Latin prose style.

Now, it never can have been good argumentation to bring forward the strongest proof first and the weakest last, nor good elocution to deliver every sentence as an anti-climax. If, for example, the first word in any combination is most emphatic, the second less so, and the last least, then every sentence, when properly delivered, must have been a sort of vocal toboggan-slide. Who can doubt that such a delivery would have been insufferably monotonous, and that the orator, of all that use human

speech, would be least likely to adopt it, or to frame his sentences so as to require it?

The laws of thought are not of any one period or language, but are valid for all who think. In the light of these, we should certainly expect the emphasis in a Latin sentence in general to be forward-moving. A period is a brief discourse. Whether it be laudatory, argumentative, or descriptive, it would seem that matters preliminary, accessory, or relatively trivial ought to be disposed of first; and the main tribute, contention, or charm should be held in reserve to produce at the end as vivid and lasting an impression as possible.

We ought also, in many cases, to be able to reach a clear judgment as to what is essentially preliminary, or relatively trivial. Which is usually more important, the time or the event, the date of the historic fact or the fact itself? Which is naturally preliminary, the protasis or the apodosis? And which is usually the more *important* clause, the supposition or the conclusion affirmed—the clause that distinctly advances the thought, with which, moreover, the subsequent statements have a logical nexus?

Probably all would answer these queries in the same way. And that which we should expect theoretically in the placing of temporal and conditional clauses, that which is true in English, in German, in Greek, is obviously true also in Latin. Temporal and conditional clauses in the vast majority of instances precede the clauses which they modify.

Not infrequently, however, such clauses follow the main clause. In such cases those who hold this theory of toboggan-slide emphasis must insist that these clauses are less emphatic, less prominent in the writer's thought, than those which precede the main clause. Let us see.

The Latin has several modes of calling special attention to a conditional clause. *Si* may be accompanied by *praesertim*, *modo*, or *quidem*. With *quidem* the clause often rises practically to the level of positive statement, and *si quidem* is rendered "since," "inasmuch as" or the like. Now, all these emphasized conditions regularly follow the main clause. *Cato Maior*, 6 "Faciam vero, Laeli [not emphatic; quiet acquiescence merely],

praesertim si utrique vestrum, ut dicis, gratum futurum est." Cato's special point is to guard against boring either of his friends, "especially" the one who has not yet spoken.

But we are not concerned at this point to analyze particular examples. The argument is from averages. Conditions emphasized by *praesertim*, *modo*, and *quidem* certainly are more prominent in thought and deserve more emphasis than those with *si* alone. The fact that they regularly follow and that ordinary *si*-clauses usually precede is of itself a strong argument in favor of forward-moving emphasis.

In similar fashion the *cum*-clause is accentuated. Since all the uses of *cum* are developed from the temporal meaning, we may for the present purpose ignore their differences. As we have *praesertim si*, so more frequently we find *cum praesertim* and *praesertim cum*. Now, certainly *praesertim* was not used to weaken the expression. And here again, while *cum* alone in its ordinary temporal or causal meaning commonly precedes, *cum* with *praesertim* regularly follows.

The same is true of the *cum*-clause of characteristic (see Hale's *cum*-constructions *passim*), and of *cum* with the force of a restrictive relative, as in Cic., *Att.*, 12, 18, 1, "longum illud tempus cum non ero." Such *cum*-clauses are certainly more significant, more essential to the progress of the writer's thought, than pure temporal clauses.

Another important instance is the clause with *cum inversum*. Here the subordination is purely formal. The principal thought or act, an indispensable link in the chain of events, follows *cum*, while the grammatically independent clause which precedes serves merely as a note of time. The element of unexpectedness, which gives this arrangement its rhetorical effectiveness, is often heightened by *vix*, *vixdum*, *aegre*, *nondum*, etc., in the first clause, or by *repente*, *subito*, etc., in the *cum*-clause. Is it not quite impossible to maintain that in such sentences the more important thought precedes?

It may not be assuming too much to suggest, even at this point, that a careful analysis is likely to show that when an ordi-

nary *cum*-clause follows the clause upon which it depends, it is to accentuate and not to diminish its importance.

Clauses of purpose and result may next be considered. Let us first clear the ground by a bit of criticism.

Safe induction must take account of the facts. It is a little surprising, therefore, to find our grammarians undertaking to teach us the emphasis indicated by the position of *ut*-clauses, when obviously they have not taken the trouble to determine what that position really is.

"Clauses appear in the order of prominence," we are told; so, usually, cause before result, purpose, manner, and the like, before the act (A. and G., 601 *b*). Bennett says (351, 3): "Clauses of purpose . . . more commonly follow." Lane and Morgan (1164): "Clauses of purpose and result . . . sometimes precede for emphasis." These divergent assertions, and similar ones that might be quoted from other grammars, agree in this, that result clauses often precede the word or words expressing the cause. The facts are that purpose clauses more commonly follow, contrary to Allen and Greenough; while pure result clauses never precede, against all the grammars that I have consulted, except Madvig (476, *a*). But substantive clauses with *ut* and *ut non*, as well as with *ut* and *ne*, like all other substantive clauses, though less frequently, do sometimes precede the governing verb. In the *Manilian Law*, for example, which fills about twenty-five pages, we find 16 purpose clauses, 12 following, 2 only preceding, and 2 of the *ne plura dicam* order. These are always unemphatic, always (naturally) come early in the sentence, or at any rate before the thing that *is* said, but depend on some word understood. Of result clauses there are, in this same oration, 56, and *not one* precedes the word or words which express the cause.² In the second oration against Cataline, 8 clauses of pure purpose follow, none precedes, and there are 3 like *ne longum sit*. Of result clauses 23 follow, 5 being substantive clauses, and only 1, of course also a substantive clause, precedes. Such is the case generally in Latin prose.

² In XV. 1, *ut aut contemnant*, etc., are counted as result clauses defining *tantis*, not after *commoveri*.

The statements of our American grammars upon this point, therefore, are seriously in error, and any inferences drawn from the supposition that result clauses often precede and that purpose clauses usually do are absolutely unfounded.

Now, one of two things is true beyond question: either the result was *always* less emphatic to the Latin mind than the cause, or the more important of two clauses frequently does come last. It may help toward a clear decision to note the vagueness that inheres in *ita* and all the other correlatives that so frequently prelude result clauses. To say *Siciliam iste ita vexavit* and stop is to say very little indeed. The curiosity of the hearers is roused—always an effective oratorical device; but the definite thing Cicero wanted to say, the climax, the sledgehammer stroke, follows in the result clause, *ut ea restitui in antiquum statum nullo modo possit*. *Is* is clearly the weakest of the demonstratives, and is precisely the one most frequently used to prepare for a clause of result. Cicero begins a sentence to Lucceius (*Fam.*, 5, 12, 6) with, *Neque enim tu is es*. Then follows a clause of characteristic containing twenty words, including five verbs. Can any soberly maintain that *neque* is the most emphatic word of the twenty-five, *enim* next “and so on”? or that the main clause is anything more than a peg on which to hang the really significant portion of the sentence?

Consider also the familiar and fairly frequent combination *tantum abest* followed by two result clauses, the first substantive, the second pure. Do not the very words affirm that the most prominent, significant, emphatic thought comes last? So far is it from being true that the more emphatic clause never comes last that in the *tantum abest* construction the last clause is explicitly declared to be the most important.

In harmony with the phenomena just considered, a general principle may be stated. Whether regarded from the view-point of the orator or the logician, the unreal, the general, the vague, the undefined deserve, and in clear thinking must receive, less emphasis than that which is real, particular, clear, and explicit. Accordingly, when an alleged reason is denied and the real one stated, the habitual order is *non quod* (*quia, quo, quin*)

sed, etc. So that which is not the purpose regularly precedes with *non ut*, and the actual purpose follows it. And in general, when a word or phrase is negated as not correct or not strong enough, the correct or more adequate expression follows. Thus in *Pro Archia*, 8: "Adest vir summa auctoritate et religione et fide, M. Lucullus, qui se non opinari sed scire, non audisse sed vidisse, non interfuisse sed egisse dicit."

Another device to set aside the inadequate is the parenthetical *non dico*. In the *Milo* (35) we read: "Quid? si haec non dico maiora fuerunt in Clodio quam in Milone, sed in illo maxima, nulla in hoc? Quid voltis amplius." Cicero distinctly indicates that the stronger follows: may we not take his word for it in a matter of Latin?

A single instance may be added of the general contrasted with the specific. Who would dream of emphasizing our Anglecized *et cetera*, or *und so weiter?* It is a striking fact that in careful Latin, words like *cetera*, gathering up vague items that are not to be further mentioned, are brought in *before* the particulars which are defined and emphasized. *Cato Maior*, 85: "Nam habit natura ut aliarum rerum, sic vivendi modum."

It may be well now to turn to a different sort of evidence. Possibly some may feel that another, arguing for the opposite view, might select other kinds of clauses and produce a very different impression.

We appeal, then, to the co-ordinating mechanism of the language. For the purposes of this discussion, all the co-ordinating conjunctions and conjunctive phrases may be grouped in certain classes. First, we have those that connect with level emphasis; those that, by themselves considered, assign prominence to neither member. Such are *et*, *que*, *aut*, *ve*, *vel* *vel*, *tum* *tum*, etc. Second, those that assign a distinct prominence to the second of the two words, phrases, or clauses thus co-ordinated. This class is relatively large. Which one of all that teach Latin ever failed to call attention to the ordinary force of *atque*? Is there any question that it commonly means "and particularly," "and what is more," or the like? This force is often intensified by *potius*, which by the way is also annexed to *aut* or

vel, thus enabling these colorless particles to add with emphasis. *Cum . . . tum* also implies the greater prominence of the second member (recognized by Kühner, Vol. II, p. 895). This force is made clearer by the frequent addition after *tum* of *vero*, *etiam*, *maxime*, etc. The same sort of ascending emphasis is indicated by the exceedingly common conjunctive phrases with *modo* and *tantum*, such as *non modo* (*tantum*, *solum*), followed by *sed*, *sed etiam*, *verum etiam*; *non modo non . . . sed etiam*, and *non modo (non) . . . ne . . . quidem*. *Quin*, *quin etiam*, *immo*, *immo vero*, and numbers of less frequent combinations might be added. Kühner speaks of "Herabsteigerung" (Vol. II, p. 671, 11, 13) in some of these cases, though he is careful to affirm: "Die Aufsteigerung ist der gewöhnliche Fall." The foible of omniscience seems to have played him false just here, for the very example he cites to illustrate diminishing stress requires the opposite. It is this: C. Seit. 20, 45: "iecissem ipse me potius in profundum, ut ceteros conservarem, quam illos mei tam cupidos non modo ad certam mortem, sed in magnum vitae discrimen adducerem." He evidently had not observed that climax in a negative sentence, or one negative by implication, requires a series of words or phrases that diminish in vigor or extent of meaning, but are delivered with increasing stress. Thus Cicero (*Pro Sulla*, 18, 50) says: "Ego non modo tibi non irascor, sed ne reprehendo quidem factum tuum." *Reprehendo* is less vigorous by itself considered than *irascor*. But it would doubtless be ineffective, or worse, in any language for the speaker to say: "I not only do not censure what you have done, but I am not even angry at you."

It would be next in order to enumerate as the third class of co-ordinating words those that assign special prominence to the former of the two members connected. But the writer is happy to relieve the reader's patience. He can be as brief as the famous chronicler who wrote upon "Snakes in Ireland." There are no conjunctions or conjunctive phrases in the Latin language that, in and of themselves, assign greater prominence to the foregoing word, phrase, or clause as over against what follows.

The only word that might even appear to be an exception

to this statement is *quam* after a major comparative. Even here it is a fair question whether the standard of measurement is not quite as important as that which is compared with it. But a moment's reflection shows clearly that in *quam* itself there is no distinct implication. If "greater than" implies the superior prominence of the first member, "not greater than" implies a parity between the two, and "less than," or "not so much as" (*non tam . . . quam*) suggests again greater stress upon that which follows. The implications, therefore, are found in the words and phrases that accompany *quam*, and not in the conjunction itself. The mechanism of comparison became stereotyped, and except with the ablative of comparison, it is as uncommon to put the standard before the thing compared as to put a pure result clause before the clause or phrase containing the correlative of *ut*.

Now, if in any combination the first word is most emphatic, the second next in emphasis, and so on, and if clauses are arranged in the order of diminishing importance, how is it that the whole co-ordinating apparatus of the language indicates either level emphasis or greater emphasis upon that which follows?

But this is not all. When words are connected by conjunctions which connote no prominence for the second member, the stronger or more significant noun, verb, adjective, or adverb, the more important phrase or clause, regularly follows.³ This one fact, if it is a fact, is sufficient, one would think, to establish progressive emphasis as the general law.

Turning to Cicero at random, we happen upon the oration for the Manilian Law. In sections 4, 5, 6, are the following co-ordinate words and phrases: *grave et periculose*; *vectigalibus associis* (note *ac*, and the fact that allies carry more weight in the orator's reasoning than mere tributaries); *causam rei publicae periculaque*; *deposci atque expeti*; *sociis et civibus* (the views of citizens are more to be considered than those of the allies); *excitare atque inflammare*; *cum magna in omnibus rebus tum*

³ In a climax of negative expressions, as just indicated, the weaker word is more "significant."

summa in re militari (readers will note here *cum . . . tum*, the general word *omnibus* followed by the particular *re militari*, and *magna* followed by *summa*) ; *sociorum atque amicorum; magna et gravia; certissima et maxima* (the certainty of small revenues would be a small matter) ; *et pacis ornamenta et subsidia belli* (he was addressing those who boasted themselves *nepotes Martis*) ; *et ipsorum et rei publicae causa*.

In all these groups we have forward-moving emphasis indicated by the connectives, or by the greater strength of the second member, or by both. One pair only remains *Mithridate et Tigrane*, in which historic order, habit, or euphony, apparently places the less important last. At most here is one instance out of thirteen in which the foregoing word or group appears to be more important.

Every Latinist has Cicero at his elbow. The proposition here laid down is neither profound nor abstruse. The evidence need not be sought in Sanskrit nor in comparative philology. If it is not Cicero's habit to arrange his co-ordinate words and groups in this way, the stronger after the weaker, the more significant and essential after that which is less so, the theory of progressive emphasis may be unfounded; if such is his habit what becomes of the opposite theories?

After holding and teaching for years the theory elaborated by Professor Greenough, the writer was forced by closer observation of the best usage to lay it aside. While collecting material for a paper on the subject, he consulted Quintilian's *Institutes* and read as follows :

Let us first, then, speak of order, regard to which is to be had in the use of words both separate and in conjunction. Words taken separately we call *δούλεια*. In respect to these, we must be cautious that they do not decrease in force, and that a weaker be not subjoined to a stronger, as *thief* to *temple-spoiler*, or *insolent fellow* to *robber*; for the sense ought to increase and rise, as in the admirable words of Cicero (*Phil.*, ii, 25,) "you with that throat, those sides, and that strength of your whole body fit for a gladiator," etc., since the words are successively of larger meaning; but if he had commenced with the whole frame, he could not have proceeded with good effect to the sides and throat. (Book ix, 4, 23.)

And he further insists (25) that the order of time should often

be disregarded, "because sometimes prior events are of greater importance and should therefore be placed after lighter matters."

But Cicero himself is the supreme authority. If he did not appreciate the relations of order and emphasis in Latin, no one ever will. The writer has studied the orator's masterpieces to small purpose, if the main contentions of this paper are not abundantly confirmed by Ciceronian usage. We should certainly expect him to follow his own theory and frame his sentences according to *Orator*, 200: "atque omnia illa et prima et media verba spectare debent ad ultimum."

SALARIES AND EFFICIENCY

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On the fifth of January, 1907, the Board of Education in the city of Chicago decided not to raise the salaries of the office boys in the employ of the board to \$800 a year. The reason for this decision was the fact that there were teachers in the public schools of Chicago who did not receive that large a salary. It is a hopeful sign, if society is at last awaking to the fact that the function of the teacher is at least as important as the function of the office boy. This high sentiment does not prevail, however, throughout the length and breadth of the land. During the Christmas holidays, at the State Teachers' Association of Iowa, I heard a paper read in which the author suggested that there should be a law in Iowa to the effect that no teacher should receive less than \$35 a month, or \$280 a year. And yet the politicians in Iowa, and in all the states of the Middle West where similar conditions obtain, dare to tell us that our schools are as good as any schools, and that they are as good as they need be. In his last message to the state legislature the reform governor of Missouri made an oblique statement to the effect that Missouri was spending more money on her public schools than any other state in the Union. He made an oblique statement to that effect—a statement from which the casual reader would infer that Missouri was most generous of all the states in its expenditure for public education.¹ The governor fully understood the subtle art of complimenting his people—of telling them in an indirect way that they were the most intelligent people in the world. For if Missouri is investing the most money in schools, the reasonable inference is that her schools are or soon will be the best, and that her teachers are or ought to be the most efficient. But let us investigate the matter

¹ The governor's statement: "The total school fund of the state amounts to \$13,325,587.76, including state, county, and township funds. This is the largest available cash school fund of any state in the Union."

and see whether the financial basis of our school system is such as to justify this sanguinity—this hopefulness on the part of our politicians. According to the last available report of ex-United States Commissioner Harris—the report for 1904, the average salary of men engaged in public-school work in the state of Massachusetts was \$148 a month, and their school year averaged almost ten months. The average salary of men doing the same work in Missouri was \$44 a month, in Ohio \$45 a month, in Iowa \$48 a month; and the average for all the states of the Middle West and South taken collectively was less than \$50 a month, and the average school year was less than seven months. If you place \$148 a month over against \$50 a month, the figures tell their own story. One does not have to be an educator to draw a conclusion from these figures; he merely has to have a moderate amount of common business sense. A salary of \$1,500 a year justifies a man in making teaching a profession; a salary of \$350 a year does not justify anything. With \$1,500 one may keep up a small life insurance, buy a few books, travel a little, have a few of the things which an efficient teacher ought to have; and yet the salary is not so large as to rob a man of that exquisite altruistic feeling that he is sacrificing his life on the altar of the common good.

But to turn more directly to one particular interest—the salary of the Latin teacher in the public high school. Our Latin has such manifest and peculiar advantages over all the other subjects of the high-school curriculum, as a means of training, discipline, and culture, that wherever it is well taught—i. e., wherever the salary is sufficient to secure the services of a thoroughly equipped teacher—the four years' Latin immediately becomes the backbone of the high-school course, and the school itself in very truth a Latin school. The people of Massachusetts are not guilty of an inaccurate use of language when they speak of the Boston Latin School, the Cambridge Latin School, the Roxbury Latin School. And it would perhaps be no case of misnomer to call by this name some of the high schools in the larger cities of the Middle West, where the salaries are not altogether inadequate. But in the towns where the population is five thousand or less—and there

are hundreds of such towns in the Mississippi Valley—the average salary of the Latin teacher in the public high school is less than \$500 a year.² What have we a right to expect for such a salary? Certainly not very much. There is no question that we are getting more than we pay for. But that does not change the general aspect of the situation. There is no reason why the prosperous Middle West should be expecting to get for \$500 service worth \$1,200 or \$1,500. And, as a matter of fact, we are not getting it. Let me cite three typical incidents that will illustrate this—incidents that have come under my observation in the past year. Last fall one of my freshmen came to me and said that he had not had a fair chance to learn Latin. He said that the principal of their home school did not know any Latin, but that he had been very anxious that their class should have a start in that subject. In order that this might be accomplished, the principal had gone down to the University of Chicago for a summer session and had studied beginning Latin. In the fall he had come back and had taught his pupils what he had learned during the summer. The next summer he studied Caesar, and the following fall taught his pupils their second-year Latin. I have a great admiration for a man who has the courage to attempt to carry out such a programme; but I feel sure that the results of his teaching will prove unsatisfactory. Another incident. A young man who graduated from our college last June was recommended, because of his administrative ability and executive force, for the principalship of a small school. He had specialized in science during his college course—had avoided language work, taking only so much of it as was absolutely necessary to meet the requirements for his science degree. He hated Latin, so he told me. And yet this fall he found himself obliged to teach the Latin classes, because he was better equipped to do it than any of the other teachers in his school. And yet he had studied Latin only two years. I do not doubt that his pupils will

² There are 194 towns in Iowa, having a population of 5,000 or less, that maintain a public high school in which Latin is taught. In 34 of these towns the Latin instructor is principal of the school; the average salary in such cases is \$675.30. In the remaining 160 schools the average salary of the instructor in Latin is \$499.64.

hate Latin—and that those who come to college will be ill-prepared to continue their work. One more incident. Last May I visited a high school in a town of one thousand population. I visited the Latin room. The teacher was a brisk young man with a good presence, an enthusiastic manner; in fact, he had all the requisites of a good teacher, except a knowledge of the subject he was teaching. In one hour he made ten serious mistakes with his beginning class; when there was occasion to use the rule for indirect discourse, he found it necessary to consult his book to find out what the rule was.

With such inefficient instruction in Latin as this in many of our smaller high schools, it is not strange that there is a general stampede to the schools of technology. It is not strange that the boys get such a dislike for the classics and literary studies that when the time comes for college they turn their backs on the liberal culture courses and go to some agricultural school or school of engineering.

Several months ago the editor of the *Classical Journal* wrote a long editorial complaining that the freshmen who came to him from year to year were inadequately prepared; he complained that their knowledge of syntax was a smattering, that in translation they were careless and inaccurate, and that when it came to prose composition they were hopelessly corrupt. The editor attributed this condition to two things: (1) that in the last fifteen or twenty years there has been invented and put into circulation a new terminology of syntax that has confused and befogged some who were accustomed to the old terminology; (2) that during this same period there has been put upon the market a new type of textbook in prose-composition, which does not lay emphasis upon systematic constructive work in syntax. There is perhaps something in both of these reasons assigned. But the real reason, I feel, lies much deeper. The Middle West has not been paying for efficient instruction in the great majority of its public high schools. In the last twenty years the secondary schools in the Mississippi Valley have been forgotten in a financial way, while a vigorous campaign has been fought for colleges and universities. This campaign has been reasonably successful. It is no longer necessary for a young man or woman to go east for

his college course or for graduate study. To be sure, there is still need of more money for higher education—for expansion along legitimate lines; but the crying need, the imperative need, of our colleges and universities is for a more liberal expenditure of money on our public high schools, in order that the great army of freshmen who come to us every year may be adequately prepared to take advantage of the instruction offered in the four-year college course.

Our educational building presents rather a grotesque appearance in its present incompleteness. It is a two-story structure. The upper story is getting to be comfortably, even sumptuously, furnished. The lower story is unfinished, is still bare and uninviting; and, strangest of all, there are very few good stairways leading to the more sumptuous upper apartments.

We congratulate ourselves that in the last fifteen years, since the report of the Committee of Ten, in which the study of Latin was so strongly indorsed, there has been an increase of 17 per cent. in the number of pupils studying Latin in the public high schools—a larger increase than for any other subject in the high-school curriculum. I am not sure that this is altogether a matter of congratulation. It means in many cases in our smaller communities that Latin has been introduced into the high schools in such a slipshod way that the community has been permanently prejudiced against the subject. This inefficiency is not due to the fact that we do not have graduate schools where teachers can be properly equipped, but to the fact that the salaries offered do not justify such training. We can never expect very large classes in the graduate courses in the classics, so long as more than 80 per cent. of our Latin teachers get less than \$500 a year, or less than the city office boy. I know a rich stockman who pays a man \$1,200 a year to care for his cattle, but he sends his daughter to a high school where the Latin teacher and the other instructors receive \$450 a year.

This stingy policy, this parsimony, has been gradually driving the men from the teachers' profession. Thirty-five years ago in Iowa 40 per cent. of the teachers in the public schools were men; today only 12 per cent. are men. And of that 12 per cent. only a fraction remain in the work permanently. Most of them

teach for three or four years, and just when they are becoming efficient turn to some work in which they can earn a living. We must admit that the criticism of the Mosely Commission is just, that there are not enough men in the public schools in America. This lack of men in the public high schools is largely responsible for the fact that many of the boys drop out of the high schools without completing the course. In the North Central states the girls in the public high schools outnumber the boys by 50,000.

Now, there are four things which we can do to help this general situation:

1. We can insist that our graduates who go out each year to teach Latin shall be as well equipped as if they were really going to get a good salary. California has set us a good example in this respect, where the new law requires that every high-school teacher shall have had at least one year's graduate work at the university.

2. We can create a sentiment for state aid for the weaker high schools, so that in the smaller communities, where the taxable property is insufficient to produce a school revenue adequate for the maintenance of a good high school, the state may step in and help. Our public-school system demands that there should be articulation between the state universities and all the public high schools. If this is not accomplished in one way, it will be in another. If the weaker high schools are not lifted to the standard of the university, the university must let down the bars and lower its admission requirements, as Wisconsin has recently done.³

3. Our Association of Teachers of Greek and Latin ought to have a legislative committee, one of whose functions shall be to keep us informed, through the columns of the *Classical Journal*, in regard to the financial side of school legislation.

4. As individuals we can help the matter along in our private and public utterances. Whenever we are called upon for a speech—whether it be a prayer-meeting talk, or an after-dinner toast, or a Fourth of July oration—we ought to find a place for the sentiment: "Gentlemen, I suggest that the salaries of the teachers in our public schools ought to be raised."

³ The bill lowering the requirements for admission at the University of Wisconsin has passed the lower house; it may not pass the senate.

THE TEACHING OF BOTANY IN THE HIGH SCHOOL

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In the teaching of any subject either of two extremes of point of view may be taken. The subject may be arranged with reference only to what will give it adequate and comprehensive organization, those who are taught being expected so to relate themselves that they grasp this logically arranged body of material. Or attention may be centered upon the individual taught, only those things being selected from the subject that contribute to the teacher's plan of educating the individual. In the first case the subject is the center of interest, while in the second it is the learner. The first case is found abundantly represented in the university where boundaries of knowledge limits in subject-matter are being widened. The second is illustrated in kindergarten and grade schools where the possibilities of the boy and girl and not those of the subject taught are the chief matters of concern. Just where one of these attitudes passes over into the other is not easy to state, but probably the transition should come at about the time that the young man or woman begins to realize what vocation he wishes to follow or in what subject he wishes to specialize. At this time educational interest in individuals does not become less necessarily, but interest in subjects has been growing so constantly and so long that it is now predominant. University men meet to discuss subjects; kindergarten and elementary-school teachers meet to discuss children and how subjects may be used with children; secondary-school and college teachers meet to discuss young men and women and the interests of the subjects to be taught. The high school concerns itself chiefly with the education of young men and women. But in the high school that sort of logical arrangement of the subject which gives best education to the students is usually that which is best for giving a comprehensive general knowledge of the subject.

I. PURPOSE OF TEACHING BOTANY IN THE HIGH SCHOOL

The primary purpose of teaching botany in the high school is found in its relation to the educational and cultural needs of young men and women. It offers an opportunity for directed experience and a study of the manifestations of life in one of its leading aspects. The method of thinking demanded by the most valuable teaching of botany is not peculiar to botany but may be developed in this field quite as well as in any other. Furthermore we need to develop the scientific method of thinking in as many subjects as possible. If people were deeply grounded in scientific thinking by experience in several fields, they would be more likely to come to use this same method when they are introduced to a new and unrelated field. Men scientifically trained in one field alone often voice ludicrous judgments in another field. High-school botany should do its part toward leading people to collect and arrange data and thereafter to make from them such conclusions as are justifiable and no others. It should teach people that judgments need often to be deferred until ample data are had, and often indeed it should teach them that the data secured do not justify any judgment. If botany and other sciences can establish a working knowledge of this method of thinking, it will help to establish the most economic and important contribution to science. A proper method of thinking is the one thing to which all other virtues are added. Professor Karl Pearson says, "Modern science, as training the mind to an exact and impartial analysis of facts, is an education especially fitted to promote sound citizenship." Professor Clifford says: "The aim of scientific thought is to apply past experiences to new circumstances; the instrument is an observed uniformity in the course of events." We are yet a long way from realization of any very large results in everyday thought and living as an outcome of scientific training. Science people themselves are sometimes examples of conspicuous failure to reserve judgment until there is a genuine basis for making conclusions. But there does exist a possibility of effecting a beneficial change in popular thought and belief and botany

may perform a part of the work to be done in bringing about such a desirable change.

The development of interest in and appreciation of nature, and particularly of biological nature, is one of the general purposes of the teaching of botany. Some such interest is inherent in the minds of young people, but this may be almost or quite removed by the kind of presentation of science subjects that is in itself lifeless and unrelated to the life interests of human beings. But few if any of the pupils of high schools will go into vocations that will entirely fail to bring them into contact with nature. Their lives may be made more full and enjoyable by having their inherent nature interests developed. A judicious direction of these interests will result in a more economic use of them, and thereby a more usable return to their possessors. Plant processes, the relation of plants to one another, their relation to animate and inanimate life, and the geographic distribution of plants are informational and cultural values of no small content.

A knowledge of plants is a source of pleasure and often of profit. Some of this knowledge we re-encounter and extend in our every-day environments. Some of it we meet in new forms during an occasional journey to more or less distant regions. Some of it enters into the material we see used in the garden, in the grocery, the drugstore, in the clothing we wear, the books we read, the treatment of our diseases, in the making of buildings, in the factory, and indeed in the experiences of every day of our lives.

But more important than this knowledge of direct interest and possible utility is the retroactive result that may come through a knowledge of certain processes in plant life. Take for example, the topic "Struggle for Existence." It is seen that many more plants attempt to live than the available water, soil, air, and light will permit to mature. The best plants, other things being equal, will be the ones that will succeed, and others must fail. Weakness and inactivity are usually the forerunners of failure, indeed are the beginnings of failure. Spasmodic activity interspersed with long periods of inactivity may give a

kind of success, but not success of the highest type. Such facts as these if properly assimilated will often produce desirable reactions upon the pupils. In the teaching of botany very little can be said concerning this ethical aspect of the work, else it becomes so insipid as to be worse than worthless and will inhibit the other values of the course. If this ethical reaction comes at all it must usually come as an "individual experience" and not as a part of the regular class exercises. The ethical aspect of science is potent and persistent but rests upon surer grounds than blatant preaching.

II. CONDITIONS OF PREPARATION OF HIGH-SCHOOL PUPILS

The amount of botanical knowledge possessed by the average entrant to the high school is so small that under present conditions nothing need be assumed at the beginning of a course in botany. Native interest will have enabled a good many pupils to gather considerable usable observations. In systems of schools where good nature-study has been done, much good botanical teaching will have been accomplished. If well-organized courses in nature-study should become general in elementary schools it will then be possible to introduce more thorough courses in botany in the high school.

The lack of previously collected data in botany is but one of the things that requires that the botany course should be simple. The immaturity of the minds to which the subject is to be presented makes entirely impossible any extended technical consideration of botany as an intricate science. These minds, however, are sufficiently mature to permit a thoroughly scientific presentation of the subject, but they do not permit adequate presentation of the details of any one or all of the sub-sciences that compose the entire subject of botany.

III. THE PLAN OF THE COURSE

The plan of the course to be used must of necessity be arranged with reference to the purpose to be fulfilled. Some of these purposes are not met by the presentation of any special fields of botany, but can be met only by presentation of all the leading special aspects. One who presents the subject from the

cytologist's point of view cannot present botany fully, neither is a full presentation possible when the plan is based solely upon morphology, physiology, taxonomy, anatomy, or economic botany. It seems axiomatic to say that a special course is not a general one. Nearly all teachers of botany say that they believe the course should be general and not special, yet our practice often gives evidence of an inconsistency at this point.

To be sure, any one of several points of view may be the line of approach, but investigation must soon lead into other points of view. A study of structure alone does not produce a general knowledge of plants. Structure is an expression of means of doing something, and we are not studying the general problem unless we try to see what it is that is being done and where and how it is being accomplished. Furthermore, pupils of high-school age are greatly interested in the ways in which human beings are related to nature, and we have not fully presented our botanical field until there is some suggestion of how it relates to man. Studying general botany by use of morphology alone is like securing a knowledge of our great transportation systems by a study of tracks, ties, frogs, and interlocking switches with no reference to why these tracks are placed where they are, or what is carried over them; or what effects are made possible in the region from which, through which, and to which they pass. Studying botany from ecology alone would be like studying the transportation system by examining the effects produced in various regions without recognizing the organic structures by means of which these effects became possible. It is true that in any course in botany, no matter how general it may be, there will be times when problems distinctly physiological, morphological, ecological, or taxonomic will receive sole attention, but merely as part of the general study, and not as classified into the special aspects above mentioned. A course in botany that is general may be almost, if not quite, as good for disciplinary purposes with high-school pupils as a special one, and should maintain interest far better, and contribute a much larger amount of valuable knowledge and a better appreciation of nature.

It seems to me that this course may best be introduced by taking up the problems of one of the plants of the kind most familiar to high-school boys and girls—one of the flowering plants. We find ourselves at once face to face with structures—roots, stems, leaves, flowers, and seeds—and must recognize and study these as structures that are related to the performance of the work that makes possible the life, growth, and reproduction of plants. Names of structures and of the plants to which they belong must be introduced in order that ideas concerning them may be expressed with intelligence, accuracy, and economy of time. Physiological experiments must be made with these structures in order to find what their work is and how it may be done. The relation of the parts of the plant to one another, to the physical surroundings, and to the other living things in the natural environment presents problems in adjustment. This sort of introduction to the problems found in plant life may be extended profitably over a considerable range of variation in flowering plants, dependent upon the personnel of the class and upon the seasons and regions in which the work is done. It should give pupils definite ideas as to the leading problems of plants, and the nature of the structures related to these problems. Further work upon special problems associated with flowering plants may well be deferred until after presentation has been made of plants simpler in form than flowering plants.

The kind of introduction to botany that is suggested above seems not only to begin the study of plants by using those forms that have entered most largely into the previous experience of the pupils, but also furnishes materials which are easily used in beginning proper methods of laboratory and field-study. It is quite possible to begin the use of complicated laboratory apparatus in the study of algae, but such may more easily and more effectively be done in studying plants whose gross structures are easily observed without the use of the compound microscope. The true function of magnification and of physiological and ecological experimentation is most easily understood when applied first to things whose structures and functions may be partially appreciated without these things.

After this extended presentation of the general problems and nature of plant life, it seems to me that the best educational benefits and most comprehensive knowledge of plants may be secured by considering plants in the order of an increasing complexity. Algae should be taken up as forms that must solve the same general problems as the flowering plants already studied, and an interest at once attaches to variations in structure, habits, and distribution as expressions of relative failure and success in making adjustments to the problems of nutrition, reproduction, and protection. When a half-dozen types of algae have been studied, the average pupil begins to classify them with reference to one another, based upon their organization for doing work. The fungi present topics of great interest to pupils of high-school age. The dependent habit of living, its effects upon host and dependent plant, lead into several important and appropriate economic problems, in addition to giving new aspects to the problems considered in the algae. An ultra-scientific attitude toward botany has been the cause of eliminating too much of the real point of life contact of general pupils with the field of botany. It would seem that even in the study of algae the pupil should get some idea of valuable and of injurious products of plants, and in the groups of fungi and the related group of bacteria the pupil should find most important relations between plants and man.

Representative forms of liverworts, mosses, ferns, and seed plants should follow, each group, as the algae and fungi, receiving morphological, physiological, and ecological consideration without the treatment being broken up into these separate divisions. In general the order of increasing complexity will determine the order of presentation of topics, and most pupils will recognize probable relationships that suggest an order of evolution of forms. All will recognize the increasing complexity as plants become better adjusted to problems of nutrition and reproduction. In a high-school course in botany it is usually unprofitable to attempt to make close connections between those details which make possible an appreciation of the various theories as to the evolution of the plant kingdom. It is one thing

to recognize the fact of an increasing complexity in plant forms and quite another to appreciate theories of organic evolution. Such an order of presentation as suggested establishes the foundation for further work in the details of relationship of groups in case such is ever attempted. What is more important relative to this point, is that it furnishes an organization for future observations and readings for all who in maturer years again consider the problem of organic evolution. It must be clearly understood that the teaching of the doctrine of organic evolution is by no means the leading and immediate purpose of the above arrangement of plant types.

Much of the material that has general educational value can most easily be arranged under such special topics as "Geographical Distribution of Plants," "Plants and the Industries," "Forestry," "Plant Breeding," "The Cereals," etc. Although most of this material is not accessible to laboratory and field-study, it is of such importance as to demand that it be included in a course that proposes to give adequate general conceptions of the field of botany.

IV. THE TEACHER

After all is said regarding the first three points of this discussion, it must be recognized that the teacher is the determining factor in the teaching of botany, as in any other subject. In most respects the pupils of any two schools are quite similar. Yet we often find that when using the same plan of course, the same textbook, and quite similar laboratory and field opportunities, all the difference between failure and success is shown in the two schools. A thoroughly good teacher will make some sort of organization of his course so that good results may follow. A poor teacher will be more efficient through being furnished good plans, equipment, textbook, and collateral reading material. It were often better for pupils and for botany, as for many other subjects in the curriculum, if the subject could be temporarily dropped, but such is rarely a feasible plan. It were far better if only thoroughly good teachers of botany were employed to teach the subject, but unfortunately there are not

enough to go around. Then there is a great difference of opinion, and doubtless always will be, as to just what constitutes a good teacher of botany. Some of the qualifications which it seems to me a good teacher of botany should have are given below.

1. There should be a thorough knowledge of the subject-matter of general botany and zoölogy with an intimate knowledge of the details of some particular field in either botany or zoölogy. It is assumed also that some knowledge of other related sciences is necessary. Too often, however, the teaching of botany is left to a person who is primarily the teacher of physics and chemistry, and who in some cases has no preparation in botany. Because of the presence of the life factor and the complications of the changing responses made in changing environments, it would seem better to leave physics to a botany teacher who is not prepared in physics than to leave botany to a physics teacher not prepared in botany. This conclusion may be due to a prejudice on the part of one engaged in teaching botany. It must be recognized that in all but the largest high-schools the "teacher of sciences" needs to be well prepared in both physics and botany as well as in other sciences.

The fields of botany and zoölogy have so many things in common that the teacher of either subject should have a good general knowledge of the other. Furthermore, if he has intimate knowledge of the details of some subdivision of one field, he will have been introduced to the method of research in such a way as to enable him to appreciate the difference between the known and the unknown. Some appreciation of the limits of knowledge in one field will help greatly to remove a feeling of necessity of knowing about all points that may arise in the process of teaching. Professional integrity has been seriously interfered with on the part of a good many people who could not be expected to know what they felt they should know. The old teacher said: "John, what is the function of the spleen?" John replied, "Professor, I knew that this morning, but I have forgotten." "You rascal," said the teacher, "all the world is wanting to know and you have forgotten it."

2. The teacher should have definite ideas concerning the function of botany in high-school education. This does not mean that to be a good teacher of botany one must have compassed the territory of educational theory in general, though some such work would doubtless be helpful. But one should know what he is going to try to do with botany if he assumes to teach it. We do occasionally arrive at places to which we did not intend to go, but we more often arrive at objective points selected before starting. Aimless botany teaching cannot produce most valuable results.

3. The teacher needs to know the relative development of the pupils to whom botany is to be taught. He needs to know their general ability, their ways of thinking, and the amount of botanical data upon which he may begin to build. There are still a good many college graduates who do the high-school boys and girls the honor of supposing them to be as mature as they themselves were when they took their college courses in botany. They attempt to teach them the quality and quantity of material that they got in college, and in the same way. The teacher needs to know the minds of the pupils well enough to enable him to defend them against some of the botany textbooks in which are presented courses entirely too technical for high-school pupils.

4. The teacher should have an active interest in teaching botany and in studying problems related thereto, since a truly active nature interest on the part of the teacher is infectious, just as truly as dead and uninteresting teaching develops immunity to nature-interest. Nearly all pupils possess an inherent interest in plant life which, if the teaching embodies proper interest, will give rise to varied spontaneous expressions.

THE DEVELOPMENT OF SECONDARY EDUCATION
IN SCOTLAND
SECOND ARTICLE

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STATE-AIDED SCHOOLS (1872-92)

The schools which fell into this class were those in which the instruction given was mainly elementary, and among which parliamentary grants were distributed in accordance with a "code" of regulations drawn up by the Scotch Education Department, one of the conditions being that they should be open at all times to the inspection of any of Her Majesty's Inspectors. While the majority of the parish schools were included in this group, their traditions regarding higher instruction were conserved by a section of the act which expressly stated "that the standard of education which then existed in the public schools should not be lowered, and that, as far as possible, as high a standard should be maintained in all schools inspected by the Scotch Education Department." In order to carry this into effect, the code made provision for the payment of special grants for the teaching of certain subjects of higher instruction called "specific subjects," among which we find mathematics, Latin, Greek, French, German, chemistry, etc.—thirteen in all. The instruction in each subject was mapped out into three grades corresponding to a three-year course in each, and the time-table of the school had to provide for continuous teaching throughout the year in the "specifics" selected. Pupils were permitted to take three subjects at most, or rather grants were paid upon successes in three only. At first fears were entertained that the demands of the elementary work in reading, writing, and arithmetic would be so much increased by the new system of inspection that they would practically make the regulations regarding

specifics a dead letter. Opinions were also expressed that specific subjects, such as domestic economy and physical geography, would prove more remunerative from the "grant" point of view than such subjects as Latin, Greek, and mathematics, and would therefore tend to displace them. However, when figures are examined, we find that in 1874, 4,407 pupils were presented for specifics; while in 1878, 33,777 pupils actually came forward for examination, and furthermore, that the number of pupils presented for Latin and mathematics was almost doubled in the same time. Notwithstanding these large increases, the feeling of uneasiness still prevailed in some quarters, and, when in 1878 the Endowed Institutions Act was passed, the commissioners created by this act were empowered among other things to submit for the consideration of the Scotch Education Department the conditions according to which, in their opinion, the parliamentary grant for public education in Scotland might be most advantageously distributed for the purpose of promoting education in the higher branches of knowledge in public and state-aided schools, especially in those districts in which there were no higher-class public schools.

In 1880 the commissioners reported that there had been much anxiety felt lest the standard of education should be lowered by the existing arrangements for the distributions of parliamentary grants, and, while in England apparently it was not intended by the Education Act (1870) to provide instruction in any of the higher branches of learning in public or state-aided schools, yet in Scotland the tradition handed down from the parish schools was so very different from this that they were not surprised at the apprehensions expressed. They then went on to say:

We are of opinion that it is not only possible to combine thorough elementary teaching with instruction in the higher branches, but that any separation of these subjects is detrimental to the tone of the school, and dispiriting to the master. It seems to us that, although it may be desirable to establish secondary schools in certain populous centers for the further advancement of children who have shown their ability at the ordinary public schools, it is not possible to establish any such means of education for the

great majority of children attending the public schools in the district to which our inquiry has special reference.

Among other things they recommended that in every parish there should be at least one teacher qualified to give instruction in the higher subjects.

That there was still unrest regarding the state of the secondary education in the country, and the disabilities under which, it was thought, the pupils in the public schools remained was evident in the legislation which followed. In 1882 there was passed the Educational Endowments Act, which contained a section to the effect that it should be the duty of the commissioners, in reorganizing educational endowments, to have special regard to making provision for secondary or higher education in *public schools*. Anticipating this act, the Scotch Education Department in its report of the same year stated:

Under this measure the governing bodies of many wealthy trusts will, we hope, by means of scholarships and bursaries enable no inconsiderable number of promising children of the poorer classes to disregard the early claims of labor and to continue their education to a later age than they do now, either in the upper classes of state-aided schools or at secondary and technical schools, to be established or reorganized by the aid of reformed endowments.

But unfortunately these endowments were mainly confined to the towns, and apparently nothing further was done for a few years for the country districts. Meanwhile there was a steady increase in the number of pupils receiving instruction in specific subjects, which was evidently taken as an indication that the traditions regarding higher instruction in public schools were being maintained. But the problem was by no means settled, and opinion varied in different parts of the country.

We find in 1884 that the principal of Glasgow University is quoted as saying:

Even now, with all the recent increased means of secondary education in our large towns, by far the greater number of university students come direct to us from the elementary schools. Therefore, in the interests—if you choose to call them so, the selfish interests—of the universities, I say, create secondary schools, and make them as perfect as you can, but meanwhile do nothing to discourage the laudable endeavors of the public schools to furnish

hundreds of their pupils with that preparation for the university, which they are eager to get and willing to pay for, and which, if they do not get there, they will never get at all.

Whereas the chief inspector of the Department for the Northern Division of Scotland about the same time said:

Before specifics came into force, the bursary competition regulated the direction and registered the success of all the higher instruction attempted in the schools. If the range of study was narrow, it was disciplinary and bracing, and, as resulting in a course of university training, opened the way to preferment in every department of professional life. The action of the code, however wholesome in other directions, has materially changed all this. It would not take more than the fingers on one hand to count the schools which, with reasonable concessions to broader culture, have steadily adhered to the traditions of the past.

It is interesting in the light of these statements to find that at this time the ratio of university students to population in Scotland was one to 617; whereas in England it was one to 5,000.

In 1886 a special attempt was made to improve the condition of secondary or higher instruction in the Highlands. In public schools in the counties of Argyll, Inverness, Ross, etc., in which a graduate in arts or science of some university was employed, the grant for a pass in a specific subject was considerably increased—in fact, more than doubled.

By this time the presentations in specifics had increased so much that the number of candidates had more than doubled since 1878, and large increases had taken place in Latin, French, and mathematics. With regard to groups of subjects, we find that 4,710 had passed in three subjects, 28,523 in two, and 28,256 in one, and that many candidates were being presented in the higher stages of each specific. It should be noted, too, that pupils were not now permitted to take specifics until they had reached Standard V (age about eleven). This large increase in instruction in higher subjects in public or state-aided schools, subsidized as they were by parliamentary grants, was not allowed to pass unchallenged. It was said, particularly in the large towns where the instruction in such subjects was systematic and well organized, and where the numbers in attendance were such as to constitute practically advanced or higher departments, that

the position of the secondary school proper was being assailed, and that the competition as between the public and the private purse was unfair. Moreover, the higher work in the public school was disparaged and characterized as superficial. Whatever truth there may have been in this criticism, the fact remained that the students from the state-aided schools continued to show, by their achievements in the universities, that they could easily hold their own with the students from the secondary schools proper.

During the next four years (1888-92) there was a gradual approximation of the instruction given to the senior pupils of public or state-aided schools to that given to pupils in higher-class schools. By a change in the code of 1890 the number of specifics for which definite courses of study were mapped out by the department was reduced to seven, namely: mathematics, Latin, Greek, French, German, agriculture, and domestic economy. But each subject was still confined to three grades, or rather parliamentary grants were only paid upon three grades. Many pupils, however, remained at the public school for four or five years, and, consequently, if a subject had to be carried on to a fourth or fifth stage, as in the case of pupils who proposed to pass to the university, no grants for such work were made. On the other hand, the financial inducements to take up a fresh series of subjects at the end of the third year, irrespective of the inclinations, tastes, and future careers of the pupils, weighed very strongly with the school authorities, and did not tend to promote the best interests of the school or its pupils. In another respect the new regulations regarding specifics showed a great advance on the previous ones. Managers were allowed to suggest courses of instruction suited to their own localities, and to draw up graded three-year schemes for the approval of the Department. As may be supposed, there was a great diversity in selection, in all twenty-one different subjects, ranging from woolen manufacturing to shorthand and Gaelic, being approved of. Meanwhile the school boards of the larger towns were experimenting in the way of "graded" public schools, some showing great activity in providing higher instruction wherever a

demand for it was shown. So far had this gone in 1889 that "one or two of the public schools of Glasgow might fairly have been termed secondary schools with a junior or primary department; and these schools, with the aid of the public rates, had proved most formidable competitors to the avowedly secondary schools;" indeed, it was publicly stated at the time that the greater number of entrants to the university came from the state-aided schools.

The year 1892 was an important one in the history of Scottish education. In the code of that year a step was taken which ultimately led to the differentiation of elementary and secondary education; at any rate, it was the first step in defining the upper limit of an elementary education in a public school. This was the outcome of a circular letter to the school boards in 1891, in which the Department had made certain proposals, and invited expressions of opinion regarding a "merit certificate," which might be looked upon by the scholars as the "goal of elementary education." While the primary intention of the Department was to institute a thorough test in ordinary elementary subjects, it also appears to have been the intention to make this test a means of selecting "those pupils for whose advantage it was that time should be spent in giving them higher education." At the same time it was hoped that pupils, in their desire to gain a merit certificate, would be induced to remain at school longer than required by the law. The code of 1892 stated that a certificate of merit would be granted to any scholar over thirteen years of age who satisfied the inspector that he had attained a standard of thorough efficiency in the three elementary subjects, and in two subjects selected from English, geography, history, needle-work, etc., and who had also passed an examination embracing all the stages of one specific subject. The reception of this scheme is best attested by the issue of certificates, no fewer than 2,346 merit certificates being granted during the first year of its operation.

In the same year, anticipating the passing of the Education and Local Taxation Account Act, and wishing to test the extent to which higher instruction was given in the higher depart-

ments of state-aided schools, candidates were admitted from these schools to the leaving-certificate examination. Evidently the views of the Department had undergone considerable modification since 1888, when strong opinions had been expressed by it against this. The continued admission of candidates from state-aided schools in subsequent years has been a tacit admission that the higher instruction given therein is at least comparable with that given in higher-class schools. *This admission of state-aided schools to the leaving-certificate examination must be looked upon as a most important stage in the approximation of the higher departments of state-aided schools to the higher-class school, and a definite step in the direction of the unification of secondary education in Scotland.*

SECONDARY EDUCATION COMMITTEES (1892)

The Education and Local Taxation Account Act, referred to, had become law in June, 1892, and by it there had been transferred to the Scotch Education Department a sum of sixty thousand pounds (the "equivalent" grant), in aid of the cost of secondary education in Scotland, and, in particular, for the following purposes: (a) defraying the cost of inspection of higher-class schools in Scotland, and of the holding of examinations for, and granting, the leaving certificates of the Scotch Education Department; and (b) making provision for secondary education, under minutes submitted to Parliament, in urban and rural districts in Scotland.

In making such provision it was foreseen that it might be advantageous to give grants to secondary schools, on condition either that a certain number of scholars should be admitted free, or that the school fees should be reduced. But hitherto, in the case of higher-class public schools, the right of fixing the fees lay with the teachers, their salaries being mainly derived from them. Since, therefore, the interests of the teachers and the spirit of the new act might be antagonistic, the managers for the future were given complete control over the fees, and, where any encroachment was made upon the interests of teachers

appointed previous to the passing of the act, compensation had to be granted.

A minute, dated August 11, 1892, was issued, by which county and burgh committees on secondary education were created. The committees had to report to the department on the existing provision for higher education in the counties or burghs which they represented. There were five burgh committees, viz.: Edinburgh, Glasgow, Aberdeen, Dundee, and Leith; one parish committee, Govan; and thirty-three county committees. Each county committee was composed of a certain number of members elected by the county councils, an equal number of members elected by the chairmen of the school boards of all the parishes and burghs in the county (with the exception of the five burghs mentioned above), and one of Her Majesty's inspectors of schools nominated by the Scotch Education Department; each burgh committee included three members elected by the town council, three elected by the school board, either two or three others selected by educational bodies in the respective burghs, and an inspector of schools as in a county committee. It was the intention of the minute to subsidize higher-class public schools both directly and by capitation grants; to treat higher-class schools similarly, where they fulfilled the same functions; to aid by capitation grants secondary departments (not claiming a share in the parliamentary grant under the code) attached to state-aided schools; and to give grants under certain conditions to state-aided schools, in which approved provision for higher education was made.

The proposals, in so far as the distribution of the grant was concerned, were freely criticized in Parliament; it was felt that they were too arbitrary, and that there was not sufficient elasticity for variations in local needs. Consequently, in the following May (1893) an amended minute was issued, by which the total grant under the act was to be distributed by the Scotch Education Department among the various committees in such proportion as the department, having regard to the population of the various districts, might determine; furthermore, each committee, guided by its own judgment as to the requirements

of the locality, and having due regard both to educational efficiency as well as to the extension of the benefits of secondary education to the largest possible number of scholars, had to submit for approval a scheme for the distribution of the sum allotted to it. To safeguard the public interests, the Scotch Education Department was commissioned to receive any objections made to it in writing by any public body or persons interested, and, in case of its disapproval, it had the power to call for a modified scheme.

Over and above the control and responsibility exercised by the burgh and county committee, the disbursement of such a sum of money required, according to precedent, some adequate and sufficient guarantee that it was fulfilling the purpose for which it was granted. This guarantee was provided for in the following clause, which we quote in full from the minute:

No grant shall be paid to any school until the Scotch Education Department is satisfied that suitable buildings with adequate equipment have been, or are in the course of being, provided; and that the buildings, apparatus, and furniture are maintained in good order and repair, that the staff is adequate, and the school efficient. The curriculum of the school must also be approved by the Scotch Education Department.

The importance of this lies in the fact that practically every higher-class school in Scotland, whether public or otherwise, either then or subsequently, accepted and continues to accept grants under this scheme. *Consequently every such school, its buildings and its equipment, its teachers and its curriculum, have, to all intents and purposes, come under the control and management of the Scotch Education Department.*

With regard to the distribution of the moneys allotted to the burgh and county committees, fears had been expressed from the first that, under the amended minute (1893), there would be a tendency to dissipate the moneys over a large number of schools instead of concentrating effort upon recognized secondary schools, or upon definite lines of development. This fear had apparently been realized, for, in the first report on the work of the county committees, we find the statement that in some cases "there had been a tendency to distribute the grants widely,

thereby incurring the risk of dissipating resources, and spending grant on work, which might fairly be overtaken by schools which are aided from the parliamentary grant." It appears that the main purposes for which the money was allotted were (1) subsidies to higher-class schools, (2) subsidies to higher departments in state-aided schools, (3) bursaries, and (4) capitation grants, allowed sometimes on the average attendance of scholars who had passed beyond primary work, and sometimes on the number who had passed certain definite tests, such as the leaving-certificate or the merit-certificate examinations. In reply to the complaint, which had been made regarding the action of the county committees, in subsidizing so freely the state-aided schools, when the grant, as it was maintained by some, was primarily intended for the secondary schools, it was stated that "it must not be forgotten that such higher education as is given in the state-aided schools is all that is open to a large number of the children, and that the inclusion of some such education in the curriculum is a traditional feature of Scottish schools." That the Scotch Education Department was fully alive to the truth of some of the criticisms was made clear in the report of 1896, which stated that in many cases there seemed to have been considerable foundation for such complaints, and care had been taken to exclude, by refusing a certificate as to efficiency and adequacy of curriculum, from the benefit of the grant those schools in which the secondary education given was trifling in amount. Meanwhile, by a minute issued in 1894, a sum of £200 for each committee had been made a first charge upon the grant, and the committee, if so disposed, had the power of expending it upon the support of higher-class schools. Finally, by a minute issued in June, 1897, definite steps were taken to check the tendency to dissipate the grant in small payments over a large number of schools. The committees were instructed to set aside the £200 above mentioned for the purpose of subsidizing higher-class schools, and to discontinue direct subsidies to any but secondary schools or departments. Certain other payments, too, by which the grants had been frittered away upon schools, whose primary object was elementary rather than secondary, were forbidden. This minute, with slight alterations,

has remained in force until the present time. It may be interesting to state that, of the £56,000 available for distribution, about one-third was assigned in direct subsidies to higher-class schools, a slightly larger amount to secondary education in state-aided schools, and the remainder mainly in bursaries and capitation grants. During the next few years we find a tendency to increase the amount of the direct subsidies to the higher-class schools. For example, the amount in 1897 was £17,500; while in 1905 it had increased to £20,000.

In connection with the burgh and county committees, an important development in the way of co-operation among the various authorities, administering grants available for education, occurred in 1896. By a minute issued in that year, provision was made for an extended representation on the secondary committees of those local authorities who were willing to intrust to the committees the administration of sums ("residue" grant) which were at their disposal for education purposes. Advantage was taken of this provision by forty-one authorities, who in the aggregate intrusted upward of £4,600 to eighteen county committees, on which they thus became represented by fifty additional members.

Notwithstanding the previous dissipation of resources caused by overlapping, and the difficulty of a proper adjustment of the conditions of distribution of the equivalent grant, the fact remains that during this period (1892-98) a great impulse was given to secondary education, both in higher-class schools and in state-aided schools. A few statistics will make this clear. We find that the number of higher-class schools under inspection had risen from 55 to 83. The number of such schools from which candidates were presented for the leaving-certificate examinations had increased from 52 to 76; whereas the number of state-aided schools presenting candidates for the same examinations had risen from 63 to 322. As for the number of pupils presented, we find that in the higher-class schools it had increased from 3,420 to 5,022; and the number of papers had risen from 14,455 to 19,697; whereas in the state-aided schools there had been an advance in the number of candidates from 1,755 to

11,240, and in the number of papers from 4,236 to 31,952. Turning now to specifics, we note that in 1892, 45,586 candidates were put forward for examination, while in 1898 this number had risen to 50,864, and that, while in the former year 4,984 were presented (3,859 passed) in three subjects, in the latter year 7,038 were presented (5,086 passed).

SECONDARY EDUCATION GRANT (1898)

We have already pointed out that there was a strong feeling in certain quarters that the higher-class schools had not been fairly dealt with by the burgh and county committees, and that the grants which had been allocated to them out of the "equivalent" grant were neither adequate nor in accordance with the spirit of the Act of 1892. When, therefore, a sum of £37,000 under the local taxation Account Act 1898 was set aside "for purposes of secondary and technical (including agricultural) education in Scotland," it was thought that higher-class schools had a first claim upon it. With reference to this the statement was made that the important function which they had hitherto performed in Scottish education could hardly be denied; and it was hoped that the limited grant then set apart for the higher-class schools would not be grudged to them. In particular, it was further stated that it should be noticed that the claims of scientific teaching as a part of secondary education were rapidly advancing, and the provision of adequate apparatus for such teaching, and the employment of a sufficient staff of specially qualified teachers, imposed burdens which could hardly be met by local effort alone. Accordingly, in the minute of April 27, 1899, we find that after £2,000 had been set aside as a further sum toward defraying the cost of the inspection of high-class schools and the leaving-certificate examination, and an equal sum toward the encouragement of agricultural education, the remainder was available for aid of such higher-class secondary or technical schools as were not in receipt of grants under the code. Any such school had to satisfy the department that it was necessary and sufficient for the district in which it stood; that an adequate contribution was made to it from local sources inde-

pendent of imperial grants; and that it was reported by inspectors, appointed by the Scotch Education Department, to be in an efficient state. Furthermore, when any application was made for a share in this grant, a statement had to be furnished showing the manner in which, *without diminishing the contributions from the school fund, rates, or endowments*, it was proposed to expend any grant which might be made. Finally, in determining the grants, a fixed sum was first awarded to each school, and this was supplemented by an amount which varied according to the average attendance of pupils over twelve years of age, and (in the case of higher-class *public* schools) the proportion which the expenditure from rates upon the school bore to the valuation of the district. The limits of grant to any one school were £750 and £300. At present some thirty-two higher-class public schools and twenty-two higher-class schools receive aid under this minute.

AN ENGLISH EXPERIMENT IN EDUCATION

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When one meets a reference to the advice given to Tom Brown by his father, on the boy's going away to school, he is inclined to consider the purely incidental place given by the latter to what is ordinarily considered to be the chief work of school as exceptional and due to the father's lack of acquaintance with schools. In a recent interview with the headmaster of one of the great public schools, I was impressed by his unconscious corroboration of the position of Mr. Brown. We were discussing the influence of some other types of English schools upon education on the Continent and I had ventured to suggest that the difficulty and, in some cases, impossibility of access to classrooms in the public schools rendered inoperative an influence which might otherwise be of great value. His reply was that men come from various countries to these schools in order to find out how character is formed in them, "and how are they to learn anything about that by visiting the exercises in the classrooms?"

In general I have found in the various countries I have visited that the more classic the subject-matter and the more formal the method, the less accessible is the work to the visitor; and I may well add that, except as an opportunity for psychological observation, the less instructive is it when seen. To state the matter positively, the more the work has reference to real needs, is in some sense vocational, and so subject to reconstruction and reasonable experimentation, the readier are all concerned to have it seen. The common excuse of school authorities, in Italy and England alike, is that the boys are so shy that a visitor disturbs them. Even in the same school in which this holds for the older subjects, one finds that the shyness disappears in a laboratory, a workshop, or a lesson in military geography. If the exercise has any other hold upon the boys than that of formal discipline and general culture, there is a degree of participation, on their part,

which enables the group to be social enough to include the observer without disturbance.

There are in England a number of schools which, to a greater or less extent, have endeavored to work upon experimental lines. When I use this term, "experimental," I mean nothing revolutionary or capricious, but a recognition of the principle of reconstruction in education. Among those which I have visited are Dr. Reddie's Abbotsholme, Mr. Badley's Bedales, and Dr. Findlay's two schools of observation in connection with the University at Manchester. It is my purpose here to report briefly some impressions of another school which differs from those just mentioned, among other things, in that it is definitely a government school. I refer to the Royal Naval College at Osborne, Isle of Wight, where boys begin upon their course of preparation for the navy. They are there for two years, from the age of thirteen to fifteen; then follow two years at Dartmouth, and two terms in an instructional cruiser, after which they are ready to go to sea as midshipmen.

In England the lower classes, even when kept in school until the common subjects are worn out and higher branches must be taught, are still in "higher elementary schools," so these lads, having been born into the ranks of the "better class," belong to the secondary-school type. A son of the Prince of Wales is among the number. They are said to be "practical" boys, rather than "students," though I was assured by an instructor that those who are of the latter class do fully as well in the practical studies as do the others.

It will be a long time, probably, before original research will recognize in such schools as this excellent opportunities for important investigation. Conditions are so different from those ordinarily found that much light ought to be shed by such studies upon a number of our problems; for instance, the opportunity for grading early upon a basis of ability, the holding together of a group throughout the course, the very few who are removed and the absence of accessions after the beginning of the course. Another topic, which would have bearing upon our need of experience with reference to that form of social co-operation

which we now call supervision, could be studied here in the division of labor that is made between the subject-teachers and the men from the navy, who have charge of gymnastics, engineering, and the home life. Each group of boys has a tutor who serves as general advisor and director of work throughout the two years. One of his duties is to attempt to meet the needs of the boys early in their course with reference to instruction on sex matters and personal hygiene.

There is a system of interchange of teachers between Osborne and the higher school by which the relations of the two institutions are rendered much more intelligent. Perhaps nothing is more interesting here than the high place given to intelligence—to judgment. One usually finds the army, and even more, the navy, brought into most of our discussions of discipline in schools, and it is generally assumed that in these institutions is found support for unquestioning and even unthinking obedience; another assumption is that obedience in the years of manhood is only possible if the boy has been trained by the practice of the habit of obedience, and that only as he becomes older can he be allowed to question. The advocate of these points of view will be shocked to learn that in this school the first object is to develop self-respect and a spirit of inquiry. The standard of obedience differs in the three divisions of which this school is the first, and becomes more exacting with age and the increase of intellectual appreciation. The outcome is a young man who does what he is told, but is able to think as well as to obey. It is said that the spirit of inquiry is very strong in the boys, that their attitude is on the whole skeptical. The atmosphere of the classrooms was certainly refreshing, compared to some of those I had seen in which the pupils were passive to a disciplinary training which had very little to do with their real selves.

The boys have comparatively little time for independent preparation; although one feels less the danger of too much teaching, more common in Europe than in America, where there is so much opportunity for participation in the class exercises, I was interested to learn that the higher school finds that the students are very strong from the standpoint of intelligent memory,

but are not equally able in the independent use of books. The problem of the due proportion of oral instruction and the use of text- and reference-books ought to be simplified by studies in this school. The laboratory notebooks were of more value than any made by older students I have chanced to find in Europe, yet there was not the devotion to fussy detail and fine appearance sometimes found in American schools.

Following is a statement from the announcement of the college as to programme and curriculum:

The year contains 3 terms of 13 weeks; and 3 leaves of 4, 3, and 6 weeks at Christmas, Easter, and Summer respectively.

The hours of study on week-days are as follows: 7:15 A. M. to 7:45 A. M. (winter); 7:00 A. M. to 7:45 A. M. (summer); 9:00 A. M. to 10:00 P. M., with a break of 15 minutes at 11:15 A. M.; 4:15 P. M. to 6:30 P. M. (winter); 2:15 P. M. to 4:30 P. M. (summer).

Wednesday and Saturday are half-holidays. There is preparation from 7:45 P. M. to 8:15 P. M. every evening except Saturday and Sunday; on Wednesday preparation is from 7:30 P. M. to 8:15 P. M.

On Sunday there is a Scripture lesson in the morning; and a period in the evening is assigned to reading, in class, English books just one stage above what the cadet would read by himself.

The period of study is 45 minutes; this is reduced to 30 minutes before breakfast (except in summer); and in evening preparation (except on Wednesdays). Two consecutive periods are taken for laboratory; and two or, more generally, three consecutive periods for engineering.

These hours of study would probably be found too heavy but for the large amount of manual instruction given. Thus, it is possible to intersperse seamanship, Swedish drill, engineering, and practical physics between ordinary class lessons. In this way the strain on the boy's attention is relieved, and an unusually large amount of work can be done without undue fatigue of any one faculty.

The division of time (per week) among different subjects in the first year is as follows: Mathematics, 9 periods of teaching and 1 of preparation; physics, 3 periods of teaching and 2 of laboratory, with 1 period of preparation in alternate weeks; French, 6 periods of teaching and 1 of preparation; history, 3 periods of teaching and 1 of preparation; English, 3 periods of teaching (including the reading-lesson of Sundays) and 1 period of preparation in alternate weeks; religious instruction, 2 periods, of which one is on Sundays; geography, 2 periods of teaching, with 1 period of preparation in alternate weeks; gymnastics and drill, 3 periods; seamanship, 2 periods, of which one is for signalling; engineering, 15 periods (nominal: some time is

lost in going to and from the workshops, shifting, etc.); with 1 period of preparation in alternate weeks.

In the second year the division of time is much the same, except that one period more is given to physics and one less to English.

This can be roughly summed up as: engineering, 15; mathematics and physics, 15; drill and seamanship, 5; language, history, etc., 20.

The engineering is easily the major subject, and evidently the other work bends to its demands. What is done in drawing, bench, lathe, forge, and other departments would surprise many teachers of older students. There is time enough given to it so that the boy makes real progress in the various shops and is able to connect the work of one with another in a manner not possible under our usual programmes. I wish that a careful study might be made of the effect of the heavy physical work upon boys of this age. That they enjoy what they are doing is evidenced by the hundreds of them who fill up the shops at free hours.

The physical condition of the pupils is good. The army and navy, after long investigation and experiment, both have adopted the Swedish drill as the basis of training. There is a recognition of the facts of growth on the physical side; for instance, the boys sleep in beds and no longer in hammocks, as it is felt that during the growing years the latter method offers hindrance to proper development. Such an advance as this gives one hope that in time we may come to the point where our relations to children in industry also may be more positive and helpful.

I shall not attempt to discuss the work in language, literature, history, etc. The English work is a much more important factor in this school than it is commonly in England. The useless is eliminated, but it is felt that the useful cannot be learned sufficiently in an incidental manner. The period on Sunday evening is given to books in English read aloud. The material selected is, as stated above, a grade of maturity in advance of that which the boys would naturally read to themselves.

The mathematics course is of especial interest. The facts that all the pupils have a definite vocation in mind, that examinations play a part only in so far as they function with reference to actual needs, and that the headmaster, Mr. Godfrey, had

already in one of the public schools been known as an advanced worker in the subject, have combined to produce some interesting experiments. Mr. Garstang, of the Bedales school, is at work on the same lines. The latter is the author of the section on mathematics in that interesting book, *The Public School from Within*. I am inclined to think that in no other secondary subject has the best practice in England so much to offer us as in this department. The general line of advance is in accord with what Professors Moore, Meade, and others have been advocating in the pages of the *School Review*. Instead of long-drawn-out drill upon the plane of arithmetical methods and processes, there is an early advance to algebraic and higher systems of notation. Students at the age when we are keeping them on the interminable intricacies of commercial arithmetic are there making the acquaintance of the higher mathematics and are using the material in practical problems. I am convinced that we underrate the ability of our students to do advanced work. I do not believe that we need to sacrifice accuracy in fundamental arithmetical processes to the extent that is done in some cases. It is unjust to a pupil to permit him to be obliged to think out the product of 7×8 when he is in his teens, but we can eliminate the non-serviceable and make it possible for a student at the close of a secondary course to have gotten some insight into the higher fields and not be helpless before a simple problem of statistics or engineering, merely because he does not know the language in which its solution requires statement.

I had heard much praise of Osborne from progressive men in various parts of England and was very glad to have an invitation to visit the school. What I saw and heard there seemed to me fully to justify all that had been said to me. The excellent relations between the naval officer in charge and the headmaster who directs studies promise much for the future development of this new school, for it has been in operation only a few years. Among the schools visited this year, this school with Bedales in England and Dr. Kerschensteiner's *Fortbildungsschulen* in Munich, with some of the schools in Frankfort a. M. in Germany, have offered the most suggestion with reference to needs in America.

THE PRESENT TREND IN THE TEACHING OF MATHEMATICS

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No recent educational movement is more remarkable, in certain ways, than the present deep and widespread interest in improving the teaching of mathematics, which is manifest in the large and constantly increasing number of associations throughout the country organized for this distinct purpose.

The movement is remarkable for the spontaneity of its inception and for the rapidity of its growth. Fully a score of organizations of mathematics teachers date their origin since 1900, among the largest of which are: The Association of Mathematics Teachers of New England, the Association of Mathematics Teachers of the Middle States and Maryland, and the Central Association of Science and Mathematics Teachers of the Middle West. An extended list of such associations, together with their officers, may be found in the October number of *School Science and Mathematics*.

Another remarkable feature of this movement is the fact that it is taking place in the face of what has, perhaps, been the most hopeless condition of inertia in modern educational history—an inertia founded upon the complacent and widespread belief that mathematics is the one branch of the curriculum which stands forth in a substantially perfect, crystallized form, the teaching of which is an accomplished art, based upon administering to the pupil, through a long and continuous régime, properly dissected portions of doctrine and exercises.

But several things have happened in recent years. For example, that heterogeneous assemblage of unrelated topics known as "college algebra," which has long held sway as an orthodox course, is now no longer offered in many colleges and universities. It has been supplanted by a more rational course in which the elements of co-ordinate geometry are blended with the

elements of the theory of equations so as to form a logical and practical extension of secondary algebra to the solution of numerical higher equations, leaving the more technical topics for late consideration in more advanced work. Even in first-class technical schools some such modification is taking place, not only with respect to college algebra but affecting a readjustment and unification of all the freshman and sophomore courses in mathematics. In the calculus great changes have taken place in the way of postponing to a later period the more theoretical portions and reading early in the course the higher applications, especially in the realm of mechanics and physics. In trigonometry also the interesting and practical applications are now made to precede rather than follow the greater part of the theory. In all subjects, graphic methods are coming to occupy a prominent place with respect to both theoretical and practical considerations.

In the field of secondary mathematics, however, the feeling of dissatisfaction is especially widespread, judging from the ever-increasing number of papers, reports, and discussions among the various associations. These have largely been directed toward the teaching of algebra and the arraignment has been chiefly against the artificial character of the problems, the preponderance of manipulation of abstract symbols as over against concrete applications, and the increasing tendency of the textbooks to force the recondite reasoning and theoretical side of the subject farther and farther down in the course, so that the beginner becomes appalled, discouraged, and not infrequently overwhelmed.

So far, the trend of the discussions has been largely iconoclastic, but hopeful signs are now appearing that a period of constructive criticism has begun.

Two representative committees of the Mathematics Section of the Central Association of Science and Mathematics Teachers have been at work, one on geometry and one on algebra, each for a period of one year. The geometry report in preliminary form was printed last summer and has been widely distributed, and the algebra report in preliminary form is printed in the October number of *School Science and Mathematics*.

These reports are to form the basis of discussion at the two sessions of the Mathematics Section of the Central Association in St. Louis on November 29 and 30. No other topics are to be considered. Every effort will be made to do constructive work in the way of practical suggestions for improving the pedagogy of these subjects in the schools. Besides the chairman of the respective committees, G. W. Greenwood of Dunbar, Pa., for the geometry, and Charles Ammerman of St. Louis, Mo., for the algebra, the leading speakers will be Professor Florian Cajori of Colorado College, Professor G. B. Halsted of the State Normal School, Greeley, Colo., Professor E. R. Hedrick of the University of Missouri, Professor G. C. Shutts of the State Normal School, Whitewater, Wis., W. W. Hart of the Shortridge High School, Indianapolis, Ind., and C. W. Newhall of Shattuck School, Faribault, Minn.

EDITORIAL NOTES

When Boston adopted the plan of a school board of five members and followed this by the selection of public-spirited, broad-minded men for its board, and by the election of Superintendent Brooks, the *THE BOSTON SCHOOLS* public looked forward with confidence to the results. The recently issued report of the superintendent for the year 1906-7 presents material which cannot fail to impress as highly significant all interested in the progress of education. The two ideals of administrative efficiency and adaptation to social needs are both represented. Various detailed improvements have already received notice in our department of "Notes and News." What could not be indicated by these single items is the effort for co-operation between various parts of the school system. The higher officials evidently realize that the best results can be obtained only by giving opportunity and responsibility to teachers. The revision of the course of study made necessary by a reduction of the elementary-school period from nine to eight years while made under the general direction of the board of superintendents was dependent for its details upon the work done by special committees.

The enthusiasm with which these committees entered upon their work, the painstaking care with which the details were worked out, and the careful scrutiny given to each item by teachers of the highest success in that particular line guarantee that the course of study is not something arbitrarily imposed by higher authority, but that it is the product of harmonious and co-operative effort on the part of all the educational forces concerned therewith.

Teachers everywhere will be especially interested in what is said of the new plan for the sabbatical year. Certain features that perhaps would not be generally thought of are already in evidence. Teachers who have applied for the year's leave of absence on half-pay for purposes of study, travel, or rest are not only to receive the advantage of that year—many are now making preparation by private study or otherwise to make the best use of the year when the year's leave is taken. Some will complete their residence for the college degree, others will travel. In the opinion of the superintendent "it is doubtful that any single provision in the new regulations will accomplish more for the benefit of the schools than the one providing for the sabbatical year."

Of special interest to teachers in high schools is the statement as to "change of ideals in high-school instruction." The fact that "approximately one-fourth of the pupils attending the high schools did not find therein work of such a standard or of such a nature that they could perform it satisfactorily" has been made a definite problem for consideration.

If now and then a pupil should fail to do the work, it would perhaps be justifiable to say that he is not qualified to profit from high-school instruction and that he should be excluded from the school; but when 25 per cent. of all the pupils in the high schools of the city fail to do the work required, a course of exclusion cannot be successfully defended. These pupils are as justified in demanding high-school instruction adapted to their needs as are the pupils who find it possible to do the work now offered.

To consider this problem, as well as the new problems growing out of the change in the elementary-school period from nine to eight years, a committee of conference was appointed, consisting of superintendents, assistant superintendents, the high-school principals, five elementary-school principals, and several high-school and elementary-school teachers. The problems were discussed "from the point of view of how the high schools will need to be modified in order to meet the needs of the pupils rather than how to make the pupils meet the present standards of the high schools." For one thing it became evident that administrative standards had an important bearing. "So long as teachers feel that their own success is to be measured by the number of pupils that reach certain fixed and traditional standards of scholarship, they must of necessity look with doubt, if not displeasure, upon those who cannot attain to those standards. What has been done is to point out clearly that the success of a teacher should be judged, and now will be judged, by her ability to provide work of such a nature that all the members of her class not grossly indolent can reach a satisfactory standard of achievement. To have 20 per cent. of a class fail to pass is full proof either that the work is not adapted to the class or that the teacher is inefficient, and yet in many classes the percentage of failures has risen to 35 or even to 40 per cent." While it is expressly disclaimed that the problem has been solved, the reader will readily agree "that the conditions for its solution have been produced." These conditions are an effort to look at the question from the standpoint of the child and a spirit of sympathy, mutual understanding, and co-operation between the elementary- and high-school teachers, and between teachers, principals, and superintendents.

BOOK REVIEWS

On the Civic Relations. By HENRY HOLT. Boston and New York: Houghton, Mifflin & Co., 1907. Pp. 668. \$1.75 postpaid.

It would be using too mild a form of expression, probably, to speak of this book as a warmed-over edition of the author's *Talks on Politics*. The material of the earlier editions has been subjected to such a fierce heat in the writer's brain that its elemental character is quite changed. The author takes no pains to conceal his real opinion of the abilities of a very large part of "so-called civilized" mankind, especially that part that labors with its hands for a living. This contempt steams up from every page until it nearly suffocates the appetite of the expectant reader. "Stupid," "lazy," "selfish," and "ignorant" are terms that are frequently employed to describe the qualities of the common herd. Yet there is an abundance of good food in Mr. Holt's book for readers with a suitable digestion. To partake of it with any degree of comfort, though, the reader who may have something of Lincoln's faith in the good judgment, sense of justice, and innate ability of the *common people* or of Ruskin's dislike and distrust of modern economic methods in the production and distribution of wealth, needs a cool day, a palm-leaf fan, and an abundant sense of humor.

Mr. Holt divides all mankind into two parts—"men without much ability who perform the manual labor, and men with great ability who tell the others what labor to perform." The second class includes only a very small number, indeed, and to them all human progress, all wealth, all civilization is due. In the words of the author "civilization has been the work of a few prize-winners, or at least prize-seekers—the men whom the chance of private property stimulated . . . the work of individual men and not of the race—of a few able men guiding the rest. The so-called civilized man . . . the moderately evolved man, as a rule, unless a higher evolved man initiates an enterprise and gives him a chance to take part in it, cannot get his own food, clothing, and shelter, and is unable to find anything to do. The man of only average ability if he is out of a job, does not get another before the man of more than average ability offers him one. Until then he is apt to sit down and fold his hands, and complain that he has not tools and material and could not find a customer if he had. The great majority of mankind, of 'so-called civilized mankind,' at any rate, is greatly dependent, then, upon this little hierarchy of Ability. And as the members of this class get more in wages than they really produce at the expense of the few men of great ability who must be content, therefore, with a smaller share than they really produced it follows that most of 'so-called civilized mankind' must be, at best, semi-parasitic." Who are these men of great ability? The writer makes two answers that appear to be contradictory. At one time he speaks of them as "the prize-winners, or at least the prize-seekers, the men whom the chance of private property has stimulated" and as the "few men (who) have most of the ability and therefore most of the property;" and then again he says "no one man ever invented any great thing, that in each process

so many elements enter that it has taken a long time to evolve them; and that during this long time the whole civilized world has learned about them and people in all countries were apt to take the final step at about the same time—or rather a variety of steps which accomplish the results," and "the promulgator of sound morals and the inspirers of good conduct—the good preachers and orators and writers, also create value in material things—probably more value than all other men put together. Probably if all that has been accomplished in the world by Christ, Confucius, and Gantama, not to speak of Aristotle, Bacon, and Spencer, could be blotted out tomorrow much the greater part of the value in material things would be destroyed." Now to reconcile these two answers the good preachers and orators and writers ought to be among the wealthiest classes of today, and Christ, Confucius and Gautama ought to have been the millionaires of their times.

But while the author does not make it quite clear as to who should be included in the hierarchy of Ability he leaves no possible doubt in the reader's mind as to the other class. This includes the followers of Henry George, the socialists, the anarchists, the trades-unionists, and most of the people who voted for Bryan in 1896. "Most of the votes for cheap money," he says, "and for all other attempts to make something out of nothing come from the ignorant and irresponsible people who are always in poverty and always ready to listen to any deceptive promise of a short-cut out of it, like socialism or communism or magical taxation, or trades-union coercion or cheap money." The thing to do then is to cultivate ability. Do away with stupidity and laziness and this question of poverty will be settled. He evidently thinks that it will be some time before most of us are able to pay our own way, perhaps several generations. In the meantime we must do the best we can and depend upon our great Captains of Industry for the rest.

Malthus' doctrine was immensely comforting to the rich landlords of his day. It relieved them of all responsibility for the poverty and suffering that they saw about them. Nature alone was to blame. It has been immensely comforting to certain types of mind down to the present time. But now Mr. Holt has fairly beaten Malthus at his own game. The people who have great wealth are of course the people who have great ability, who have always produced more than they have consumed, while the people of little ability have reaped the benefit.

As an example of the author's one-sided way of looking at things a single case may be cited. As has already been stated, he has almost unlimited faith in the operation of the law of Supply and Demand as a means of bringing about a fair distribution of wealth. "As justice can be reached only through the natural flow of supply and demand to obstruct either by any sort of coercion is to go counter to natural law and is one of the best definitions of immorality." Now the individualist begins to take notice. He begins to have a growing feeling of sympathy with the great writer. "Immoral is it to obstruct the operation of law?" Surely, the trust, that great arch-enemy of the law of Supply and Demand and its promoters are in for it now. But no. The writer is not thinking of the capitalistic trusts while preparing this morsel. He is on the scent of the labor union. He has disposed of the capitalistic trusts in a few mild sentences of doubtful meaning and has actually paid a pretty compliment to

the Great Father of Trusts, but it takes nearly a hundred solid pages besides numerous long paragraphs scattered throughout the entire book to fittingly set forth his ideas of the nefarious sins and practices of the wicked labor unions.

Yet it would not be quite fair to the writer to say that he can never see two sides to a question. The question as to whether the sphere of government should extend beyond national defense and the protection of rights is an open one, he says. There are wise men on both sides. "Aristotle, the first systematic writer on politics, took both sides" and the author himself finds it impossible to take a definite and final position in this matter. "The supplying of convenience by the government," he writes, "appears to be a natural evolution, being on the whole considerably further advanced in the highly evolved nations than others." In his discussion of the question he makes it plain, however, that in his opinion the United States is not far enough evolved yet to attempt very much in this direction. The advocates of government ownership and operation of public utilities would hardly agree that his discussion of this question is quite a fair one from their view-point, but they may at least find some comfort in the fact that in advocating these doctrines they do not put themselves beyond the pale of reason, common-sense, and good morals.

EDWARD E. HILL

CHICAGO NORMAL SCHOOL

L'Abbé Daniel. By ANDRÉ THEURIET. Edited with Introduction, Notes, and Vocabulary, by ROBERT L. TAYLOR. Henry Holt & Co., 1906.

A pretty story of country life in France, suitable for elementary French classes. The simplicity of style is well suited to the narrative, and the many charming descriptions of peasant scenery and life are characteristic of the work of the venerable Academician. The notes are well chosen, and the vocabulary excellent.

Le Voyage de M. Perrichon, Comédie en quatre actes. By EUGÈNE LABICHE AND EDOUARD MARTIN. Edited by I. H. B. SPIERS.

Le Monde où l'on s'ennuie, Comédie en trois actes. By EDOUARD PAILLERON. Edited by WILLIAM RALEIGH PRICE. The International Modern Language Series. Ginn & Co.

These attractive editions of two popular French comedies are intended, as the abundant notes and vocabularies indicate, for elementary classes. After the text and based upon it the editor has, in each case, added "Exercises for Composition" and "Questions for Conversation," which afford valuable material for practice in writing and speaking, thus enabling the pupil to acquire a command of the words and phrases used by the authors.

Le Tartuffe. By MOLIÈRE. Edited, with Introduction, and Notes, by JOHN E. MATZKE.

This edition of Molière's masterpiece is intended for advanced classes, and is prepared in a thorough and scholarly manner. The Introduction treats of the "Origin and Spirit of the Play," the "History of the Play," the "Sources of the Play," and the "Characters and the Play." The text is preceded by the *Préface* and the three *Placets au Roi* of Molière. The notes are exhaustive and well chosen.

One Hundred Fables. By LA FONTAINE. Edited, with Introduction, Notes, and Vocabulary, by O. B. SUPER, PH.D. International Modern Language Series. Ginn & Co.

The publishers do not recommend this book to very young pupils, but owing to the number and variety of the fables it contains and to the notes and vocabulary it should appeal to any students of mature mind. Although less than half of the fables are given here which appear in the standard editions of La Fontaine, they are so carefully chosen that they give a fair idea of the genius of this popular poet with whom no student of French can afford to remain unacquainted. The notes, while giving sufficient linguistic help, are chiefly noteworthy as a literary commentary, containing much valuable information.

E. B. BABCOCK

CHICAGO, ILL.

A First Book of Poetics. By MARTHA HALE SHACKFORD, PH.D. Boston: Benj. H. Sanborn & Co. Pp. 37.

Dr. Martha Hale Shackford's little volume entitled, *A First Book of Poetics*, aims to give simply worded definitions, abundant illustrations, and a few suggestions in regard to supplementary books for further study. The brevity of the book (it contains only 37 well spaced pages) certainly precludes any elaborate statements concerning the primary principles of the poetic art, but it does not excuse the shortcomings of the author in her unscholarly attempts at definitions of the simplest poetic terms. Dr. Shackford's definition of "end rime" as "the riming of the last stressed syllables at the end of successive verses," is both misleading and incorrect. Had the author made a definite statement regarding the vowel sounds being alike, the sounds before the vowel sounds being unlike, the sounds after the vowel sounds being alike, and the identity of stress, she would have made some understandable foundation for her definition. "A stanza," says Dr. Shackford, "is a group of two or more consecutive verses bound together by end rime." With such a definition in his mind how would a pupil classify the divisions in Tennyson's "Tears, Idle Tears," and in Collins' "Ode to Evening"? Another misleading and inaccurate definition in this book is the one defining a song: "A song is intended to be sung and must, therefore, contain open vowels and liquid consonants." Comment on the definition is unnecessary, but we cannot forbear calling attention to the author's unique classification of Wordsworth's "The Green Linnet" as a song—qualifying her classification by calling it a "nature lyric;" a nature lyric it undoubtedly is; but a "song"—! One other example of an inadequate definition will be sufficient: the author declares that "mystery play is identical with miracle play"!

The book is likewise inaccurate and unscholarly in regard to illustrations. On p. 11—to cite one example—the author, without any qualifying statements, says: "The English sonnet, considered less perfect artistically than the Italian, is made up of three quatrains and a couplet, riming *a b a b c d c d e f f d d*." Where else in the range of the study of poetics can we find that Shakespeare's sonnets are the only English sonnets? Moreover, Dr. Shackford, notwithstanding her assertion that she has provided "abundant illustrations," has limited her illustrations generally to one example.

In general this book seems to us a piece of shoddy, hasty, and unwarrantable patchwork of book-making. That the author wrote such a book "to meet the needs of a class in the outline history of English literature" is, mildly speaking, an insolent sling at the general intelligence of teachers of English literature.

H. E. COBLENTZ

MILWAUKEE, WIS.

The Essays of Elia. By CHARLES LAMB. Boston: Houghton, Mifflin & Co. Pp. xx+226.

The selections in this book are good, the introduction giving a sketch of Lamb's life is well fused, and the notes are pleasing and helpful, but why should not the publishers tell us who does this editorial work? No. 4 Park Street, Boston, where the book is published, is, we all know, so full of literary celebrities that some distinguished name could have been attached to such a fresh little book. Many teachers dislike to use a book edited in blank; the name of some competent teacher or student adds dignity and lends authority to the book.

H. E. COBLENTZ

MILWAUKEE, WIS.

The Story of Robinson Crusoe in Latin. Adapted from Daniel Defoe's famous book, by G. E. GOFFEAUX; edited, amended, and rearranged by P. A. BARNETT. Longmans, Green & Co., 1907.

Sixty or seventy years ago Goffeaux prepared a translation of some of the adventures of Robinson Crusoe in Latin for use with young students, in the belief that it would furnish material better adapted to enlist their interests and energies than the more formidable Caesar and Cicero. After four or five French editions, it was printed in England with English notes and enjoyed considerable popularity in the Latin schools. It is this English edition, revised, abbreviated, and amended by P. A. Barnett, that is now presented in a new and attractive dress for our consideration. Although the Latinity of the text is naturally open to the criticisms which all pseudo-Latin is heir to, the perennial charm of Defoe's immortal story is but little dimmed and one wonders if after all the old French master was not wise in thus baiting the flagging interest of his tirones. Nothing could better illustrate the difference between the degree of proficiency attained by English and American boys at corresponding stages in their Latin training than the fact that these 112 pages of somewhat difficult text should be recommended as a substitute for Caesar with only 6 pages of notes and no vocabulary. It would be difficult, perhaps, to find a moment in our present crowded curriculum for anything so unique and fascinating, but many a jaded teacher might find in it valuable material for translation at sight and hearing in the latter part of the second and throughout the third year of our present course.

J. RALEIGH NELSON

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DISCUSSION

To the Editor of the School Review:

On my return from a year's exile abroad, I have for the first time seen Professor Stempel's review of the *Brief English Grammar* of which Miss Buck and myself are joint authors. Generally speaking, I do not believe in replying to a reviewer's criticisms; it is better to accept them in a contrite spirit and profit by them. Besides, the reviewer erred, if at all, on the side of leniency. I should make no comment in this instance were it not that one or two sentences in the review in question are so worded as to imply—or at least to permit the reader to infer—that the authors of the book were unfamiliar with recent researches in phonetics and historical grammar. Such implication or inference is, to speak modestly, not quite fair. At any rate, the authors would prefer to plead guilty on another count—that of not having said, in every instance, all that they knew. The fact is, that in the preparation of a brief and elementary textbook intended for all sorts of schools and all sorts of teachers, one cannot proceed as if one were writing a scientific monograph. One must often decide between a traditional, easily intelligible, not quite comprehensive statement or definition, on the one hand, and a strictly accurate but complicated and disconcerting statement, on the other. To speak of but one point, although I have read, I think, everything of importance that has been written on the English genitive, I should still be inclined to explain the apostrophe (especially if I were limited to ten words) as indicating the omission of the old English *e*. To reduce Jespersen's forty-eight pages on this subject to a single, clear, easily intelligible sentence, would perhaps not be impossible, but it would require one of those moments of inspiration which come unsought—if they come at all.

But, as I suggested at first, the authors have really no fault to find with the reviewer in his detailed criticisms, except that he was too sparing of them.

FRED NEWTON SCOTT

UNIVERSITY OF MICHIGAN

BOOKS RECEIVED

EDUCATION

Das höhere Lehramt in Deutschland und Österreich. Ein Beitrag zur vergleichenden Schulgeschichte und zur Schulreform. Von HANS MORSCH. Leipzig and Berlin: B. G. Teubner, 1907. Pp. 136. M. 5.

Youth: Its Education, Regimen, and Hygiene. By G. STANLEY HALL. New York: D. Appleton & Co., 1907. Pp. 379.

A Brief Course in the History of Education. By PAUL MONROE. New York: The Macmillan Co., 1907. Pp. 409. \$1.25.

ENGLISH

Theories of Style in Literature. With especial reference to prose composition, essays, excerpts, and translations. Arranged and adapted by LANE COOPER. New York: The Macmillan Co., 1907. Pp. 460. \$1.10.

An Introduction to the Study of Rhetoric. Lessons in phraseology, punctuation, and sentence structure. By HELEN J. ROBINS AND AGNES F. PERKINS. Pp. 315. \$0.90.

Selections from the Prose and Poetry of John Henry Newman. (Riverside Literature Series.) Edited by MAURICE FRANCIS EGAN. Boston: Houghton, Mifflin & Co., 1907. Pp. 327. Paper \$0.30; cloth \$0.40.

Selected Essays of Emerson. (Riverside Literature Series.) Edited by MARY A. JORDAN. Boston: Houghton, Mifflin & Co., 1907. Pp. 324. Paper, two parts, each \$0.15; cloth, one volume, \$0.40.

Selections from Poe. Edited, with Biographical and Critical Introduction and Notes, by J. MONTGOMERY GAMBRILL. Boston: Ginn & Co., 1907. Pp. 134. \$0.60.

Selections from Byron. "The Prisoner of Chillon," "Mazeppa," and other poems. Edited, with Introduction and Notes, by SAMUEL MARION TUCKER. Boston: Ginn & Co., 1907. Pp. 101. \$0.25.

Coleridge's Rime of the Ancient Mariner and Other Poems. (Merrill's English texts.) Edited, with Introduction and Notes, by JULIAN W. ABERNETHY. New York: Chas. E. Merrill Co. Pp. 156.

LATIN

First Book in Latin (second edition). By ALEXANDER JAMES INGLIS AND VIRGIL PRETTYMAN. New York: The Macmillan Co., 1907. Pp. 301. \$0.90.

FRENCH

The Sounds of the French Language: Their Formation, Combination and Representation. By PAUL PASSY. Translated by D. L. SAVORY AND D. JONES. London and New York: Oxford University Press, 1907. Pp. 134. \$0.60.

SPANISH

Esrich's Fortuna and El Placer de no Hacer Nada. Edited, with Introduction, Notes, and Vocabulary, by EDWARD GRAY. Boston: Ginn & Co., 1907. Pp. 82. \$0.50.

ESPERANTO

Esperanto in Twenty Lessons. By C. S. GRIFFIN. New York: A. S. Barnes & Co., 1907. Pp. 100.

SCIENCE AND MATHEMATICS

A Field Book of the Stars. By WILLIAM TYLER OLcott. New York and London: G. P. Putnam's Sons, 1907; Chicago: A. C. McClurg & Co. Pp. 163. With 50 diagrams.

Evolution and Animal Life. An elementary discussion of facts, processes, laws, and theories relating to the life and evolution of animals. By DAVID STARR JORDAN AND VERNON LYMAN KELLOGG. New York: D. Appleton & Co., 1907. Pp. 489. Illustrated. \$2.50.

Elements of Plane and Spherical Trigonometry. By JAMES HOWARD GORE. New York and London: G. P. Putnam's Sons, 1907. Pp. 200.

HISTORY AND CIVICS

A History of Commerce. By CLIVE DAY. New York: Longmans, Green & Co., 1907. Pp. 626.

When America Was New. By TUDOR JENKS. New York: Thomas Y. Crowell & Co., 1907. Pp. 320. Illustrated. \$1.25.

GEOGRAPHY

Larger Types of American Geography. Second Series of Type Studies. By CHARLES A. McMURRAY. New York: The Macmillan Co., 1907. Pp. 271. \$0.75.

MISCELLANEOUS

A Tuscan Childhood. By LISI CIPRIANI. New York: The Century Co., 1907. Pp. 269. \$1.25.

Good Stories from the Ladies' Home Journal. Philadelphia: Henry Altemus Co., 1907. Pp. 128. Illustrated. Illuminated boards, \$0.50.; ooze calf, boxed, \$1.00.

NOTES AND NEWS

The report of the Committee of Seventeen on the Professional Preparation of High-School Teachers will be published entire in two ways: (1) in the 1907 volume of *Proceedings* of the National Educational Association, (2) as a separate monograph. The separate papers of every member of this committee will appear in this volume.

Professor Edwin G. Dexter of the University of Illinois has been appointed commissioner of education for Porto Rico and has entered upon

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his duties, having been granted leave of absence for an indefinite period by the university.

The New York Public Library announces that books for the blind will be sent free by mail to the nearest post-office, although they may not be delivered by letter-carriers.

In addition to the committees noticed in our September issue the board of directors at the Los Angeles meeting of the N. E. A. authorized the appointment of the following committees of investigation, and made an appropriation of \$500 for the expenses of each, viz.: on the culture element in education, on the system of teaching morals in public schools, on industrial education in rural schools, on shortage of teachers, on provisions in public schools for exceptional children, and on courses in manual training for elementary schools.

"A bill to provide an annual appropriation for industrial education in agricultural high schools and in city high schools, and for branch agricultural experiment stations" was introduced in the House of Representatives by Congressman Davis of Minnesota. It is expected that this

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will be considered during the coming session. The part relating to high schools is as follows:

Be it enacted, etc., That there shall be, and hereby is, annually appropriated, out of any money in the Treasury not otherwise appropriated, to be paid, as hereinafter provided, to each State and Territory for the maintenance of instruction in agriculture and home economics in agricultural high schools of secondary grade and instruction in mechanic arts and home economics in city high schools of secondary grade, a sum of money equal to 10 cents per capita of the population of each State and Territory, respectively, as shown by the last preceding national or State census, as shall be apportioned by the Secretary of Agriculture and estimated for in the annual estimates submitted to Congress for the Department of Agriculture: *Provided*, That the funds thus appropriated shall be used only for instruction in agriculture, mechanic arts, and home economics, and that all States and Territories and all schools accepting these funds shall provide other funds with which to pay the cost of providing the necessary lands and buildings and of instruction in all general studies required to make well-rounded high-school courses of study: *And provided further*, That not less than one-half of the sum thus appropriated to any State or Territory shall be expended for instruction in agriculture and home economics in agricultural high schools maintained under

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State authority in rural communities, and the number of such agricultural high schools which shall be entitled to receive the benefits of this act in any one State or Territory shall not exceed one school for each ten counties in that State or Territory.

The *Mantel, Tile, and Grate Monthly* for August has an article which is of interest to teachers of design in technical high schools and manual-training schools. Written from the standpoint of the tile business, it notes that while tile is useful it is also decorative, and can best be handled by salesmen who have taste and who can give advice as to color schemes and designs especially fitted for individual demands. The writer welcomes the fact that our technical high schools and manual-training schools are training pupils in drawing, designing, and the use of colors. He points out that other artistic industries are waking up to the fact, and go to these schools for promising boys to go to their employ on graduation. Proficiency in drawing and display of taste will enable a man to be doubly useful as a salesman.

Many managers and salesmen have excellent ideas, much better ideas, in fact, than the draughtsmen in a tile factory can possibly have, because they come in contact with decorative architects and such of the public which have ideas and good taste. But they are not able for the lack of training in the use of their pencil and the water-color brush to put their thoughts in shape. It takes too long for them to write to the factories about it, and even when they do, the designer in the factory generally misses the point, and makes it something conventional and so the idea is lost. But if this man had a young fellow with him in the office with such training as we have spoken of, he could carry out his ideas on paper for him at odd moments, when he is not engaged in other work. The set of sketches would be of the greatest service to him in the course of a little time in getting better prices in the run of small jobs and ultimately for the larger. The writer has seen a half-dozen beautiful water-color sketches from the factories thrown over in an architect's office in favor of a rough sketch on manilla paper jotted down in the architect's presence by a young fellow who saw what the architect wanted, and by the aid of his facility with his pencil could show him that he was able to give it to him.

Under the provisions of an act of Congress approved August 30, 1890, there has been paid annually for some years by the federal government, the sum of \$25,000 to each state and territory for the more complete endowment and support of colleges of agriculture and the mechanic arts. By an act of March 4, 1907, provision is made for an annual increase of that appropriation by the sum of \$5,000, over the amount for the preceding year, until the annual appropriation to each state and territory reaches the sum of \$50,000, which shall be the amount to be appropriated annually thereafter. Part of the increase of the appropriation may be expended for the preparation of teachers of elementary agriculture and mechanic arts. The duties connected with the administration of these provisions of Congress are performed by the Bureau of Education.

The appropriations made by the Fifty-Ninth Congress for the two years 1907-1908 to the Bureau of Education are respectively \$173,190 and \$275,260.

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Of this, \$100,000 for the first year and \$200,000 for the second are for the education and support of the schools for the Alaskans, Indians, and other natives. All the expenditures of money appropriated for school use in Alaska are under the supervision of the commissioner of education.

The last report of the committee of education (for the year ending June 30, 1904) shows a continuance of the decline in the percentage of high-school students studying Greek. In view of this it is interesting to note that the colleges are in some cases taking up the work of elementary Greek. Thus Brown University announces that its course in elementary Greek will be continued. Every year about half a dozen men (and the same number at the Women's College) begin the study of Greek in the university. In one year they do about what is done in two or three years in the preparatory schools and are then ready for the regular course in freshman Greek.

Dr. Arthur McDonald, in a paper read before the American Psychological Association gave as the result of his pain measurements on different classes of individuals the following result among others:

1. Girls in private schools, who are generally of wealthy parents, are much more sensitive to pain than girls in the public schools. It would appear that refinements and luxuries tend to increase sensitiveness to pain. The hardihood which the great majority must experience seems advantageous. This also accords with our previous measurements, that the non-laboring (professional and mercantile) classes are more sensitive to pain than the laboring classes.

2. University women are more sensitive than washerwomen, but less sensitive than business women. There seems, however, to be no necessary relation between intellectual development and pain sensitiveness. Obtuseness to pain appears to be due more to hardihood in early life.

3. Self-educated women, who are not trained in universities, are more sensitive than business women. The greater sensitiveness of self-educated women as compared with university women may be due to the overtaxing of the nervous system of the former in their unequal struggle after knowledge.

4. Girls in the public schools are more sensitive at all ages than boys. This agrees with the results of our previous measurements that women are more sensitive to pain than men. But this does not necessarily refer to endurance of pain.

The University of Illinois has called Professor Goss of Purdue to a position of dean of the College of Engineering and director of the School of Railway Engineering. This school is newly organized, and will include training for railway organization and operations as well as railway engineering.

